

A tall, lattice-structured radio tower stands prominently in the center of the frame. At the very top of the tower, a person is visible, seemingly working on the antenna system. The tower is surrounded by a dense, green forested mountain range. In the background, more mountains are visible under a clear sky. The overall scene conveys a sense of remote communication infrastructure in a natural setting.

# Amateur Radio

**VOL 54, No 2, FEBRUARY 1986**

**JOURNAL OF THE WIRELESS  
INSTITUTE OF AUSTRALIA**

**VK1 wins the 1985 Remembrance Day Contest  
— full results this issue**

**Amateur Band Plans**

**Repeaters — the Future**

**IARR Conference Report**

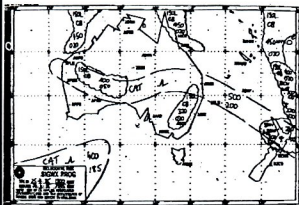
**Magazine Awards for 1985**

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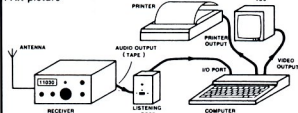


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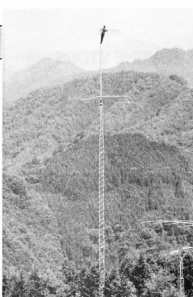
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Hide JA4MBM, on top of his "Mountain Top" antenna system. See VHF UHF — an expanding world, page 26 for full details



# Amateur Radio

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This month's magazine contains the Amateur Radio Awards for the preceding year, (see p 31). These are awarded each year to encourage participation in Amateur Radio by members — will your name be included next year.

There is quite an amount of general information about the future directions of the hobby. Firstly, there is a brief summary of the IARU Conference, held in New Zealand, during November. This summary details some of the items which were decided, and many items which will be considered at future conferences.

Repeaters — the future, page 8, details repeaters generally, and indicates some of the steps the WIA proposes to take on various repeater issues.

Ron Henderson VK1RH, discusses Amateur Band Planning in two separate articles, page 20 and 22. Ron explains the definitions of and anticipated future of Band Planning.

The Remembrance Day Contest results are announced on page 40. Congratulations are in order for the VK1 Division, the winners for 1985. Also in the contest pages are the rules for this year's John Moyle Memorial Field Day Contest. Remember to read them carefully.

This month we welcome a new Federal Awards Manager, Ken VK5AKH, to the columns of AR. Ken begins his column with an updated listing of the WAWKA Award.

## DEADLINE

All copy for inclusion in the April 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st February 1986.

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EDITOR BILL RICE\* VK3ABP  
TECHNICAL EDITORS PETER GAMBLE\* VK3YRP  
PETER GIBSON\* VK3AZL  
EVAN JARMAN\* VK3ANI  
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CONTRIBUTING EDITORS Brenda Edmonds VK3KT  
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Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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# Editor's Comment

## MAINLY TECHNICAL

As recently mentioned, we hope to publish many more technical articles this year than we were able to in 1985. Those of you who feel impelled to write them are invited to start writing now. *We need your help!* But what kind of material should you, the author, be sending us to publish? What do you, the average reader, most want to know about?

We have had a few ideas fed back to us recently, particularly because of the queries about the future of amateur radio which have been raised over the last six months or so. There is an excellent discussion of that subject elsewhere in this issue. But it does seem that we need more articles aimed at the newcomer and the Novice. Construction articles, simple pieces of test equipment, or accessory items for the usual commercial transceivers. Antennas are always a popular subject, because most people can still build their own.

Don't worry if your article seems too elementary. We will tell you if it really is! On the other hand, many things which the

older amateur takes for granted, (*everyone knows that!*) may be news to the newcomer, and perhaps just the missing pieces needed in the theoretical jigsaw he has struggled with for weeks. *Is there a generation gap?* If so, it may well cut both ways. There are thousands of young people out there who have cut their teeth on computers and to whom digital techniques are second nature. But to the older amateur, maybe quite at home with RF and linear circuits, this "newfangled digital technology is all black magic!" Here, surely, is an area where the young can teach the old.

But even though the future of the hobby inevitably involves more and more digital technology, may I sound a cautionary note. We have a need for more basic theory and hardware-oriented articles, rather than basic programs and simple software. Someone I was talking to recently is, for example, eagerly awaiting a "how to build it" article about a good stable VFO with digital frequency read-out. *Does anyone have one, ready to write*

*up?* We have space ready and waiting to print it. And how about some packet-mode hardware?

Also in this issue we have another article on aircraft enhancement of VHF and UHF propagation. There are apparent divergences of opinion on this topic, which can only be resolved by more users getting into the SSB DX scene on two metres and 70cm. More stations, spread more widely, would show more clearly the dimensional extent of this fascinating phenomenon, which permits communication on a near-routine basis over distances many times farther than line-of-sight, without benefit of inversions, ducting or Sporadic-E. Here is a chance for the Amateur Service to add something to the fund of human knowledge, to be once again at the cutting edge, as amateurs always were in earlier years.

*Have I thrown out enough challenges yet? I hope so. Let us get into the action!*

Bill Rice VK3ABP  
Editor  
AR

# NEWS FROM GREAT BRITAIN

## NEWS FROM LONDON

**50MHz for UK** — The Department of Trade and Industry has announced an allocation of 50.000-50.500MHz for the amateur radio service, effective from 1st February 1986.

This follows an experimental period, begun in February 1983, when 40 special transmitting licences were issued to existing amateurs to use 50.000-50.500MHz for a program of experimentation and learning about propagation conditions in the band, followed by a further 60 licences issued in 1984.

At that time, UK 405 line television transmissions still existed in Band 1, and all amateur working took place outside normal broadcasting hours, using low power. All television transmissions ceased early last year, and following negotiations with the RSGB the DTI has finally agreed conditions for the new band, taking into account the continuing use of Band 1 by European broadcasting stations.

Restrictions have been imposed to minimise the risk of amateur transmissions interfering with established European services, but the DTI has agreed to review the use of the band after a year to see if the operating conditions can be relaxed.

The conditions from the first of this month are:

- the allocation shall be primary within the United Kingdom
- initially, only Class A licensees permitted access to the band
- maximum power at all times shall be — Carrier 140dBW (25 watts) ERP, PEP 20dBW (100 watts) ERP
- maximum transmitting antenna height to be 20 metres above ground level
- antennas shall be horizontally polarised
- no mobile, portable, or temporary premises operation will be allowed
- there will be no restriction on modes or hours of operation
- no repeaters will be allowed on the band
- existing permits will be withdrawn.

There has been some anticipation of the new allocation, since a preliminary statement was issued by DTI, last June. Several magazine articles have already appeared showing how to get on the new band in various ways, and a number of transceivers, transverters and linear amplifiers have arrived on the market.

With present propagation conditions, this does not seem to be the best time to embark on 50MHz, but a number of enthusiasts seem to be eagerly awaiting the "off", and it will be interesting to see how it all works out.

Contributed by AR's London Correspondent, Tony Smith G4FAL

## RSGB TESTS MORSE

Britain's Department of Trade and Industry announced on 2nd December 1985, that it had appointed the Radio Society of Great Britain to take over the running of amateur radio Morse tests on its behalf from 1st April 1986.

British amateurs have two types of licence, Class B — VHF only, and Class A — all bands. The 12WPM Morse test, which is a pre-requisite of the Class A licence, was conducted for many years by the Post Office, and is currently administered by British Telecom. DTI invited new proposals for running the test from the RSGB, Telecom, and the City and Guilds of London Institute, the examining body for the radio amateur's examination.

The new arrangement includes a seven pound test fee, to be held at this level for two years, and the establishment of at least 70 testing centres, one in each county, region, or designated island. Tests will be held every two months in each centre.

There are currently 27 900 Class A, and 27 783 Class B amateurs in the UK.

Contributed by AR's London Correspondent Tony Smith G4FAL

## SAINT DAVID'S DAY

The Saint David's Day Special Event Station will again be operational on the 1st March 1986 to

celebrate the National Day of Wales.

The station will be operational from midnight Friday 28th February to midnight Saturday 1st March 1986. Activity, conditions permitting, will be on all the HF amateur bands.

A team of enthusiastic operators will be pleased to make contact, and as always, will endeavour to send greetings to as many countries as possible, world-wide.

The Special Event QSL card will be sent to all amateurs making contact with the SDD station. SWLs are also welcome to send reports.

All licensed operators interested in the attractive Saint David's Day Award should aim to meet the following requirements:

Contact should be made with the Special Event Station on Saint David's Day, 1st March, and five other Welsh Amateur Stations during the months of February and March 1986. To claim the Award, forward copies of logged contacts together with seven IRCs, to cover P&P to — Event Co-ordinator, R.R. Jones GW4HOQ, "Bryn-Ynys" 13 Strawberry Place, Gorrishan, Swansea, West Glam. SA6 7AG.

## SOUND MAGNIFIED 1 000 TIMES

In the aftermath of an earthquake, rescue workers have an near impossible task — how to locate survivors buried beneath the rubble. In the Mexico City earthquake survivors were found days after the quake. GCS Communications Control Inc, manufacturers of sophisticated security equipment, have devised the BD-301, a device which amplifies sound up to 1 000 times. It can effectively allow rescue teams to hear sounds emerging from buried victims and thus pinpoint their location. These sounds would be absolutely impossible to detect with the unaided human ear.

This unit has been used by firefighters to determine life behind closed doors, and to detect fire within walls. It has also been used with success in mining cave-ins.

# PROPAGATION VIA REFLECTIONS FROM AIRCRAFT

In my article "Enhanced VHF/UHF Signal Levels due to Aircraft", (AR Oct 1985)<sup>1</sup> I explained how the phenomenon known as Aircraft Enhancement<sup>2</sup> could be accounted for by the known effects of passive reflectors. An essential point of my article was that it was a presentation of irrefutable mathematical truths derived from engineering texts. It was not theory. The technical editors of AR may have missed this point because they have subsequently published a contradictory article by Roger Harrison VK2ZTB<sup>3</sup> in which he expounds a theory which purports to explain the phenomenon. The Harrison article is scrutinised in this critique and some points, briefly mentioned in my previous article, are explained in greater detail.

## Differing Opinions?

Giving reasons why he doesn't think that direct reflection from the aircraft is the cause of aircraft enhancement, Harrison states "There are widely differing opinions, even in the engineering texts, as to how to calculate the signal levels after reflection from the aircraft." (As a passive reflector) Is this really the case?

I consulted several engineering texts and compared their formulas for passive reflector gain and path loss via passive reflector links with those given in my previous article, henceforth called "Aircraft Reflectors"<sup>1</sup>. Following is a summary of what I found:

a — Norton's<sup>4</sup> formula for the path loss on a two hop system using a passive reflector in the far field is:

$$L_p(\text{dB}) = 171.1 + 20 \log d_1 + 20 \log d_2 - \log a^2$$

The distance is measured in miles and  $a^2$  is the effective area of the passive reflector in square feet. This is the same as in Aircraft Reflectors<sup>1</sup>. The formulas for effective area and passive reflector gain are the same as in Aircraft Reflectors<sup>1</sup>.

b — The ITT Handbook<sup>5</sup> editors do not give a formula for path loss being content to simply refer to Norton<sup>4</sup>, i.e. the same as in Aircraft Reflectors<sup>1</sup>.

c — Contributors Jakes and Robertson<sup>6</sup> give the total transmission loss for a 'single mirror passive repeater' as:

$$(\text{Loss dB}) = 10 \log \frac{\lambda^2 d_1 d_2}{A_{\text{eff}}^2}$$

AT, AR, and AI are the effective areas of the transmitting, receiving, and passive reflector antennas respectively and  $d_1$  and  $d_2$  are distances in the same units.

In Aircraft Reflectors<sup>1</sup> AT and AR are isotropic antennas so the effective areas of isotropic antennas must be used in order to compare the results. The effective area of an isotropic antenna is

$$\frac{\lambda^2}{4\pi}$$

When this adjustment is made, the results obtained with this formula are the same as given in Aircraft Reflectors<sup>1</sup>.

d — Brodhage and Hornum<sup>7</sup> give the path loss as:

$$\text{Apd}(\text{dB}) = 20 \log \frac{d_1 \times d_2 \times \lambda^2}{\text{Sep} \times \text{Seu}}$$

$d_1$  and  $d_2$  are in metres, Seu is the reflector effective area and Sep is the effective area of the parabolic reflector used at the terminals. Substituting the effective area of isotropic antennas the formula becomes:

$$\text{Apd}(\text{dB}) = 20 \log \frac{d_1 \times d_2 \times \lambda^2}{\text{Seu}(\text{Aeff})}$$

This gives the same path losses as given in Aircraft Reflectors<sup>1</sup>.

e — Freeman<sup>8</sup> says the path loss is:

$$\text{GT} + \text{GR} + \text{GA} - a_1 - a_2$$

Gs are transmitting, receiving and passive reflector antenna gains and a's are path losses, all in dB.

$$\text{GA} = 20 \log$$

$$\frac{4\pi A_{\text{eff}} \cos \alpha}{\lambda^2}$$

(Passive Reflector Gain)

A is the reflector area (total) and  $\alpha$  is half the angle between incident and reflected waves. Watch the signs and you will get the same results as in Aircraft Reflectors<sup>1</sup>.

f — Carl<sup>9</sup> states "The gain of an evenly illuminated flat reflector is the same as the gain of a dipole combination with reflector"<sup>10</sup> and:

$$\text{G(dB)} = 10 \log$$

$$\frac{4\pi A_{\text{eff}}}{\lambda^2}$$

(A is Aeff)

Note that this is the one way gain, i.e. half that given in Aircraft Reflectors<sup>1</sup>. However he also states that the path loss F is:

$$F_1 + F_2 - 2G_1 - 2G_2 \text{ (The path losses)}$$

So — Foxes G twice anyway. This gives the same results as in Aircraft Reflectors<sup>1</sup>.

g — The formula for path loss used by the Lenkurt Electric Co Inc<sup>10</sup> gives the same results as in Aircraft Reflectors<sup>1</sup>. It is formula (27) on page 100 of their publication.

On page 99, referring to 'billboard' type metal reflectors the author states "With surfaces of adequate flatness it is close to 100 percent efficient, as compared to about 55 percent efficiency for antennas".

Furthermore, the passive reflector acts as both a receiving antenna and a retransmitting antenna, and it's 'gain' is therefore applied twice,<sup>11</sup> i.e. the same as stated in Aircraft Reflectors<sup>1</sup>.

h — What about Picquenard<sup>12</sup>? Harrison implies that his opinion, at least, differs. The truth is that Picquenard doesn't address the matter of radio links using passive reflectors at length.

However he does give a nomogram for path loss via a passive reflector. It is Figure 184 on page 287. The distance scale will cover the Canberra to Melbourne path and the passive reflector effective area scale, which he calculates in the same way as in Aircraft Reflectors<sup>1</sup>, will cover the Aeff of a 747 at 37 000 feet half way between those two cities.

The path loss scale is a little short as it finishes at 200dB but an easy extrapolation will result in the same path loss as given in Aircraft Reflectors<sup>1</sup> for the conditions considered, i.e. approx 208dB.

The foregoing clearly indicates that Harrison's assertion about differing opinions is

wrong. In fact, all authorities agree that the passive reflector has gain, they agree on how much gain a reflector of a given size has and as a result they all agree on the path loss to be expected from a given link with a passive reflector in it. Their methods differ slightly but the end results are invariably the same.

Furthermore Harrison's calculation of path loss between VK3UM and VK2ZAB is also wrong simply because it does not include the gain of the passive reflector.

The foregoing also clearly indicates that the methods used in Aircraft Reflectors<sup>1</sup> are correct for passive reflectors and also for aircraft because there is surely no doubt that the performance of a flat piece of metal as a reflector is not dependent on the nature of the supporting framework behind it even though this may be the rest of an aeroplane.

## Observations

Harrison's summary of reported observations contains several which require comment. Are they accurate? Are they reported in an unbiased manner? Let us examine a few of them:

a — "Signal level lift" observed is estimated to be 30-60dB." Signal level lift from what? Where is this observed? Is it the same everywhere? One thousand to one million times is a fair degree of uncertainty! It is difficult to imagine this observation being of any use to anyone.

b — "Signal level lift and period of enhancement are dependent on upper-air wind conditions, etc".

This is not an observation; it is a conclusion. Is it couched in this manner because Harrison needs it to support his hot air theory?

In fact, all it amounts to is that Canberra amateurs claim that when aircraft enhancement is poor from them to Melbourne, aircraft report turbulence. It has not been clearly related to Sydney to Melbourne contacts and it is not clear whether or not turbulence is always reported when aircraft enhancement is always poor when turbulence is reported.

In any case signal conditions vary for a quite different reason and at best there is only a coincidental relationship to turbulence. This is explained in more detail in the next section of this article.

c — "Stations in Frankston (Melbourne) hear stations in Sydney some two to three minutes earlier than VK3UM, who is located about 40km closer to Sydney".

This is a misleading half truth. Whereas stations in Frankston have been observed to hear Sydney stations earlier than VK3UM hears them, the estimate of two or three minutes relates to how much earlier the Frankston stations hear Canberra<sup>12</sup> and the estimate was made early in the aircraft enhancement experiment when VK3UM was active on two metres rather than 70cm as he is

now. In the case of Sydney stations, although they are heard in Frankston earlier than VK3UM, the time difference has not been clearly established.

VK3UM is located 40km closer to Sydney than Frankston, however he is also located about 16km north-west of a line between Frankston and Sydney and about 15km north-west of a line between Frankston and Canberra. Later in this article I will show that this is more significant than the 40km mentioned by Harrison.

d — "Backscatter propagation is noted between Canberra and Sydney stations ... This phenomenon is only noted during exceptional 'lift' conditions".

This needs to be clarified quite a lot. In fact at least two Canberra amateurs who regularly take part in aircraft enhancement contacts have been in the habit of referring to signals heard via the back of their beams as 'backscatter'. How can genuine 'backscatter' be correlated to 'exceptional lift conditions' under these circumstances?

In any case what exceptional lift conditions between Canberra and Melbourne? Both? Or between Sydney and Canberra perhaps?

In spite of these uncertainties, backscatter does occur and when it does doppler shift also occurs. The magnitude and direction of the doppler shift is consistent with back reflections from an aircraft retreating from both Sydney and Canberra, i.e. past Canberra on its way to Melbourne. Harrison does not mention this, probably because he didn't know about it. However, it does not help his hot air theory much either.

Incidentally, while on this subject, some amateurs have expressed concern about the lack of doppler shift on Sydney-Melbourne and Canberra-Melbourne contacts.

Doppler shift only occurs when there is a change of path length, transmitter to receiver. This happens in the backscatter case but does not happen, or strictly speaking, only happens marginally when the aircraft is near the terminals, during the Sydney-Melbourne and Canberra-Melbourne contacts. Hence there is no doppler shift on those paths.

e — "The size and type of aircraft seemingly has little bearing on the enhancement characteristics, etc".

This is simply not true. It would help the Harrison theory if it was, but it clearly is not. I know of no observers anywhere who would agree with this.

The signal levels are clearly proportional to the size and operating altitude of the aircraft. This has been confirmed many times over the Sydney-Melbourne and Canberra-Melbourne paths as well as in local reports of overseas observations, albeit somewhat sloppy observations<sup>13</sup>.

Furthermore, dozens of aircraft enhancement contacts between VK2ZAB and VK4s AUR, AGQ, KJL, and others less frequently on 144.300MHz, together with some contacts between VK2ZAB and VK4AGQ on 432.300MHz have been made at signal levels consistent with the size of the aircraft operating between Brisbane and Sydney at the times when the contacts were made.

The facts are clearly consistent with the path loss and signal level calculations made on the basis of the aircraft as a passive reflector as set out in Aircraft Reflectors<sup>1</sup>. Harrison's summary of observations is clearly biased toward his hot air theory. The omission of the doppler shift in the backscatter observation and the false suggestion that the aircraft size is unimportant, together with the lack of comment on operating altitude clearly show this bias.

However, why does the enhancement mode fail sometimes and what is this about the

footprint moving backwards? Let us examine these matters further.

#### Radar Holes<sup>14</sup>

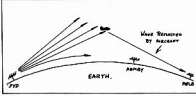
In Aircraft Reflections<sup>1</sup> I drew attention to the fact that anomalous propagation, other than aircraft enhancement, occurs at some time almost every day<sup>15</sup>.

When a group of amateurs are participating in regular scheduled operations, as the aircraft enhancement fraternity are, the laws of chance dictate that other forms of anomalous propagation must sometimes coincide with the aircraft enhancement time slot.

Tropospheric temperature inversions occur frequently causing super-refraction of radio waves and tropospheric ducts<sup>16</sup>. This should be well-known to all VHF/UHF enthusiasts because it gives rise to enhanced signal levels at distant locations and hence 'tropo' contacts.

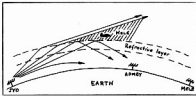
When ducts coincide with aircraft enhancement schedules it may be thought that the combination would result in even bigger and better signals and indeed sometimes it does. My first 70cm contact with Angus VK4AGQ, in Brisbane, was undoubtedly aircraft assisted tropo.

However, perhaps more frequently than not, the coincidence of ducts and aircraft results in poor aircraft enhancement signal levels.



**Figure 1a — Normal Aircraft Enhancement Situation. Note: Some low angle waves refracted in normal troposphere provide contact between Sydney and Adaminaby.**

Consider Figure 1a: This is the normal aircraft enhancement situation. The signals in Melbourne and Sydney are enhanced by reflection from the aircraft and the signals from Adaminaby are normal in Sydney. There is no duct.

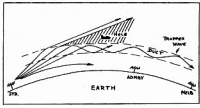


**Figure 1b — Aircraft Enhancement Sydney to Melbourne is poor because Aircraft does not intercept signal from Sydney. However, Sydney to Adaminaby signals are good.**

In Figure 1b a refraction layer of air caused by a temperature inversion has formed and the aircraft is above it. This results in a decrease in the power density available at the aircraft and aircraft enhancement signals are poor. Signals from Adaminaby are good in Sydney.

In Figure 1c the degree of inversion is such that a duct has formed and the signal has become 'trapped' in the duct. Aircraft enhancement signals are poor. Signals from Adaminaby are normal in Sydney.

The reduction in power density at the aircraft also results in a reduction in the level of the back-scattered signal so the aircraft may disappear off radar screens. The aircraft is said to be in a 'hole'. It is a well-known and understood phenomenon.



**Duct traps wave so that Sydney to Adaminaby signals are back to normal but still no Aircraft Enhancement Sydney to Melbourne.**

It is clear that this mechanism is a more likely cause of reduced aircraft enhancement signals than having the hot air blown away in the wind.

Nevertheless, it may be that the meteorological conditions, which give rise to ducts, also give rise to turbulence, as reported by the aircraft, so the observations made by Canberra amateurs may be, coincidentally, valid.

There are diurnal and seasonal variations in the prevalence of inversions so there will also be diurnal and seasonal variations in their coincidence with aircraft enhancement conditions.

#### Path Geometry and Footprints

Harrison says that: a — The fact that Sydney (or Canberra) stations are heard in Frankston before they are heard at Chirnside Park (VK3UM) indicates that the signal footprint on the ground moves backwards, i.e. towards the aircraft; and b — That direct reflection from the aircraft would require that the footprint moved forward at twice the speed of the aircraft. Thus, he says, the two are contradictory.

This is nonsense. Proposition a is wrong, proposition b is irrelevant and the contradiction would only apply in a one dimensional world.

The signal footprint on the ground is in the form of a long ellipse modified by terrain irregularities. The long axis of the ellipse lies along the continuation of a line joining the transmitting station with the reflecting aircraft. This pattern may be simulated with a torch (flashlight) resting on the floor of a darkened room so that its beam is at a slight positive angle to the floor, i.e. the floor is not directly illuminated but the circle of light falls on a wall about 500mm up from the floor and say four metres from the torch.

Now hold a small (75-100mm diameter) mirror face down and parallel to the floor. Lower it into the beam 300 to 400mm in front of the torch and observe the pattern of illumination on the floor.

The shape of the mirror will change the pattern somewhat, as will the shape of the aircraft change the footprint. However, our purpose will be served without considering the complexities introduced by this factor or diffraction effects at the edges, departures from flatness or the earth's curvature. The footprint will be generally elliptical with the long axis along the signal path.

Now consider Figure 2. This illustrates the general case encountered in practice. The flight path of the aircraft crosses the signal paths from transmitter to receivers at an angle.

The signal footprint illuminates receiving site 'A' at a medium distance from the transmitter, it then illuminates site 'B' somewhat further away from the transmitter and then sites 'C' and 'D' simultaneously even though 'C' is closer to the transmitter than 'B' and 'D' is further from it.

The time between illumination of successive sites depends upon the speed of the aircraft, the location of the receiving sites relative to the transmitter and the angle the flight path makes to the signal paths.







# TRY THIS

**Jim Linton VK3PC**

4 Ansett Crescent, Forest Hill, Vic. 3131

## DIPOLE FORMULA

Putting up a dipole is probably a project undertaken by most radio amateurs at one time or another, but getting them to work is something else.

Text books give a formula for calculating the length of a dipole in feet as  $468/\text{frequency in MHz}$ , but this doesn't do the trick according to Des VK3DES and Bill VK3DXE who operate portable from Enochs Point, in Victoria.

They cut a dipole for 14.2MHz one weekend using the above formula, and found it was too long.

Cutting and trimming it back using an SWR meter they finished with a shorter length of wire, which gave good results.

Dividing the length back, a new formula giving the length in metres as  $136/\text{frequency in MHz}$  was found, and applying this to an 80 metre dipole, and then other bands, it worked out perfectly.

Des said that while the usual formula may work over a perfect ground plane or at a greater height, the 136 formula worked perfectly at a height of 4.5 to 7.5 metres above ground and no balun was needed.

At Enochs Point they use a combination 80 metre dipole and 40 metre inverted Vee, both cut to the 136 formula, without balun, and jointly feed with 50 ohm coax, which gives a 1:1.2 SWR.

The 40 metre inverted Vee has an apex angle of 120 degrees. The insulator is a toothbrush handle and ordinary PVC coated building wire is used.

**Technical Editor's Note** — Length formulae for dipoles are considerably affected by closeness to ground and wire sizes. Consequently they only serve as a starting point for adjustment. The formulae have been metric converted.

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but again shelved.

The point is that "Aircraft Enhancement" is Bistatic Radar. It is not now. The system parameters were worked out long ago and it all happened before the jet age. There is not much of a ball of hot air behind a ship or a Ford trimotor.

## Conclusion

The Harrison article has been shown to be inaccurate, misleading and illogical. The enhanced signal levels, due to aircraft, are caused by reflection from the aircraft itself. Harrison's article fails to provide an alternative to this historical, well-documented, engineering fact.

**NOTE:** The foregoing arguments are clear and convincing, but do not eliminate the possibility of a hot air refraction mechanism also taking place. Clarification of the debate as to the relative magnitudes of reflection and refraction can only occur with the provision of much more carefully recorded data, particularly as regards absolute signal levels. Go to it, chaps! — Ed.

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## YOUTH RADIO

One of the latest amateur radio stations in China is BY1SK, located at the Xuanwu Youth Technical Centre, in Beijing.

The Centre, which was set-up three years ago, is an after-hours institute where about 1 000 students pursue subjects in extra-curricular classes ranging from oceanography to model ship-building.

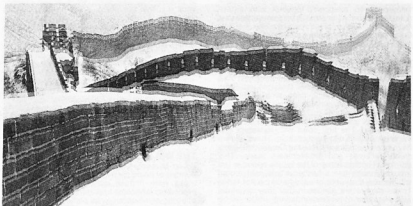
One BY1SK operator is 13-year-old Zhou Ti, a

sixth grade pupil. He spends two to three afternoons a week at the centre and has a good on-air operating technique.

BY1SK uses a TR-7 transceiver on CW and SSB, often between 0600 and 0930UTC.

About 50 students at the centre, aged between 10 and 18 years, are interested in amateur radio and shortwave listening.

QSL information for BY1SK is — *Amateur Radio Station of Youngster Xuanwu District, PO Box 2916, Beijing, China.*



$\text{Lar(dB)} = 141.98 + 20 \log d_1 + 20 \log d_2 - 20 \log \text{Aeff}$

Where  $d_1$  and  $d_2$  are the distances in km from the terminal sites to the aircraft and Aeff is the effective area of the aircraft reflector in square metres. For a flat sheet:

$\text{Aeff} = A \sin \theta$

Where A is the reflector area in square metres and  $\theta$  is the angle of incidence of the signal.

Consider the following:

a — Obviously, if the distances decreases the path loss will decrease. Signals from Canberra are stronger in Melbourne than signals from Sydney.

b — The examples given in *Aircraft Reflectors* assume  $d_1 = d_2$ . If  $d_1$  does not equal  $d_2$  the path loss will decrease. The 747 on track for Eildon Weir crosses the Canberra to Frankston line much closer to Canberra than to Frankston. Therefore, provided it isn't counteracted by any other factor, the signal from Canberra will be about 5.5dB or one 'S' point better in Frankston than that indicated in *Aircraft Reflectors*.

c — If the aircraft flies higher than the nominal altitudes given in *Aircraft Reflectors*  $\theta$  will increase, Aeff will increase and the loss will decrease, but not by much. Work it out for yourself.

d — In *Aircraft Reflectors* the examples of signal levels were based on aircraft as reflectors equivalent in area to the aircraft's wings. This is the only uncertain parameter in the formula.

Obviously bigger aircraft are bigger reflectors and cause lower path losses but is the area 'A' of a given aircraft equivalent to a flat sheet of the same area as its wings?

Persistent claims by amateurs who claim to have properly calibrated 'S-meters' indicate that the signal levels might be slightly higher than those given in the *Aircraft Reflectors* examples.

Furthermore theory indicates that the forward scatter cross section of even a sphere is greater than the backscatter cross section<sup>18</sup>, so it may be that parts of the aircraft other than the flat undersides contribute to the equivalent area and hence to Aeff resulting in a reduction in path loss beyond that given in the *Aircraft Reflectors* examples.

Nevertheless, even if the equivalent flat sheet area of the aircraft is twice that assumed in *Aircraft Reflectors*, the path loss will be reduced by no more than 6dB or one 'S' point on the examples given.

## History

Reflecting objects such as ships and aircraft have been causing enhanced signal levels at receivers a considerable distance from the transmitter for almost as long as radio has existed. Reflections from aircraft were recorded in 1931 and a series of experiments were carried out, using among other things, a Ford trimotor and a transmitter on about 72MHz.

These early observations led to a system for the radio detection of ships using 'wave interference' equipment which later became known as "Bistatic Radar".<sup>19</sup>

Bistatic Radar uses transmitters and receivers a considerable distance apart (comparable to the target range) instead of at the same location (Monostatic Radar).

The system had disadvantages which caused it to be dropped in favour of Monostatic Radar, but not before it had been noted that one of its advantages was the dramatic increase in signal level which obtained when the transmitter, target and receiver were all in line (180 degrees Scattering Angle).

The system was investigated again in 1955,

# REPEATERS - THE FUTURE

*Repeaters were first introduced into Australia in 1969. The history of this very successful form of amateur radio activity was detailed in a series of articles by Tim Mills VK2ZTM, and published in the March to June 1985 issues of Amateur Radio. In recent times repeater activities have been subjected to a variety of pressures. This article details some of these pressures and indicates the steps that the Wireless Institute is proposing to take on various repeater issues.*

**Peter Gamble VK3YRP  
CHAIRMAN, FEDERAL TECHNICAL  
ADVISORY COMMITTEE**

## INTRODUCTION

Some of the pressures on repeater activities are obvious. In the more populated states, as more groups seek to gain licences for voice and special mode repeaters (such as RTTY and Packet) there is pressure on the increasingly crowded band space allocated to repeaters. Other pressures come from interference problems, as some repeater channels become difficult to use due to the high levels of RF found on the choicest sites. Still other pressures come from the regulating authority, the Department of Communications, as they seek to regulate this amateur activity.

In September 1984, the DOC published a discussion paper entitled 'Review of Amateur Terrestrial Repeaters'. This paper was circulated by the Federal Executive of the Wireless Institute to the Divisions. The Federal Technical Advisory Committee (FTAC) also examined the paper and co-ordinated the replies. Some of the issues raised in the paper were accepted by the majority of amateurs as being reasonable, while other issues were rejected. While discussing these comments with the DOC, they requested that a paper be prepared outlining the WIA views on repeaters.

At the same time, Packet Radio was emerging as a new communications process and the DOC indicated that the WIA should make a submission on this topic also. There was obviously a link between these papers, as one of the network elements that the packet radio experimenters wanted to introduce were repeaters. However, these repeaters were not the traditional type of voice repeaters consisting of a receiver and transmitter, but devices that included the computer processing power to handle the packet protocols.

To cope with these requests from the DOC in a manner that would ensure that all of the WIA Divisions had an input into this policy formulation process, FTAC was reorganised at the 1985 Federal Convention. While the aim of this Committee was the same as before, that is 'to advise the Federal Executive on all technical matters appertaining to amateur radio and to manage the RF spectrum as directed by the executive', its method of working has changed.

The Committee consists of a chairman and various expert members, together with a representative from each state. It was envisaged that liaison would take place between the Federal Committee and the various state technical committees that exist, thus ensuring the widest spread of input to the technical policy making process. Reports prepared by FTAC would first be circulated within the Committee. Following any comments and discussion they would then be circulated to the Federal Executive, Divisions and State Technical Advisory Committees, who would consider the matter in conjunction with appropriate specialist user groups.

Since this process started, two papers have been drafted. The first deals with repeaters and the second deals with packet radio. These papers have been circulated within the Committee, comments received and amendments made. This article will outline some of the issues raised in the repeater paper, and a further article next month will discuss a number of aspects of packet radio. These papers are similar in that they conclude with a number of recommendations which will be put to the 1986 Federal Convention and, if

accepted as WIA policy, will be presented to the DOC.

## THE DOC DISCUSSION PAPER

The Discussion Paper 'Review of Amateur Terrestrial Repeaters' starts by noting that repeater stations may be considered an enhancement of the value of the Amateur Service. Further, they expect the popularity of repeater communications to increase as amateurs use their innovative skills to design and plan new systems. The paper continues "Such activity should be encouraged, however it is essential that guidelines be formulated to permit an orderly progression of the service. It is of course impossible to fully predict the eventual products of the amateur's imaginative application of the electronic radio arts and accordingly such guidelines should be flexible to permit expansion and encompass future technological advancements."

There is then a need to clarify the use of repeater stations. While a voice repeater may be primarily designed to enhance the range of communication for a mobile station, the same does not apply to an ATV repeater! The DOC also notes that conflict has, on occasions, resulted in the department having to arbitrate on what could be regarded as an internal amateur matter. Thus, co-ordination through a single body would be an advantage.

The paper then goes on to talk about the criteria for the consideration of applications for new repeater systems. These include the site and coverage of a new installation, significant reasons for the establishment of an additional repeater covering the same area as an existing system, and spectrum conservation aspects.

Another significant matter raised is that of equipment standards. This is related to the problem of interference, especially where the interference is due to another installation, but the amateur installation ends up being closed down. "Should amateur repeater standards be adopted, commensurate to commercial specifications such a restrictive provision may no longer be necessary," the paper continues.

The remainder of the paper considers the issue of cross-linking repeaters. Some of the applications received are noted, and some reasons for the requests listed. The paper then lists a number of things which are to be taken into consideration when a cross-linking proposal is received.

The paper concludes with some recommendations that include:

\* Cross-linking should only be permitted within the same amateur band

\* The 1240 - 1300 MHz band may be best suited for link frequencies

\* Cross linking of voice repeaters may be authorised provided that the extended coverage does not provide access to stations located within the bounds of capital cities, a demonstrated need exists, and no more than two repeaters are to be linked.

## THE WIA RESPONSE

It can be seen from the above that there are a number of items of concern to amateurs. Some of these were flagged quite early in the review process as it became apparent that the DOC were applying some commercial standards to amateur radio that were not warranted.

The WIA Discussion Paper 'Review of Amateur Radio Service Terrestrial Repeaters' starts by providing some background on repeaters including some of their typical uses. The new regulations, which came into force in August 1984, are then reviewed. The paper then goes on to consider some of the implications of these regulations. The following paragraphs are paraphrased from the WIA paper.

## THE NEW REGULATIONS

The following paragraphs examine the new regulations in some detail and compare them with the Amateur Service aim of experimentation and self-regulation, with and without amateur practice.

### Repeater Station Licences

The Wireless Institute believes that licences for the operation of a repeater station should only be granted to a group of amateurs, as has been past practice, and not to individuals. Further, a repeater should be considered as a community resource, and thus available to all amateurs, irrespective of their membership of any club or organisation.

### Use of Repeater Stations

Paragraph 4.13 of the Regulations makes two comments on the use of repeaters that require examination. The first is that approval of the repeater/translator will depend on 'the requirements of that particular area'. There does not appear to be any elaboration of this requirement. It may at first be construed as relating to the allocation of operating frequencies, in which case there can be a valid reason for ensuring that it complies with the appropriate agreed band plan, and also ensuring a reasonable geographic spread of stations operating on the same frequency.

However, it could also be construed as applying to the 'needs' of the particular area. The corollary of this interpretation is that the Licensing Authority (the Department of Communications) could then be required to make a valued judgment as to whether another repeater was needed. For example, does a major capital city with seven existing two metre voice repeaters need another one? Does a country town with one existing lightly used repeater need a second one?

The Wireless Institute believes that the justification or need for a repeater is a matter for the Amateur Service to determine and not a matter for a value judgment by the Licensing Authority.

The second point of concern, from paragraph 4.13, is the intention that repeaters shall not be used for long distance communications. While the initial aim of repeaters was the extension of the communication range of VHF and UHF mobile stations, they now have a variety of uses and support various modes of communications. These rules for the efficient use of a voice repeater may be quite inappropriate for an amateur television or packet radio repeater.

Guidelines for the use of various types of repeaters have been published from time to time by the Wireless Institute and it is considered that this is the most appropriate method for handling these matters.

### License Application Requirements

Paragraph 4.14 of the Regulations provides for the method of applying for a repeater/translator license. One problem in this area that has occurred on a couple of occasions is the co-ordination of frequency allocations. These have generally related to repeaters adjacent to state

borders, where two, or more, states need to consider the implications of a particular proposed installation.

While the Wireless Institute has no objection to the Licensing Authority considering these matters, it believes that in the first instance these matters should be considered by the Wireless Institute. This does not imply that the Institute wishes to 'take over' all of the repeaters, but to co-ordinate the many diverse groups which construct and operate repeaters.

The Amateur Service is an experimental service and repeaters are paid for by amateurs themselves. The experience of amateur repeaters is many and varied, and the Wireless Institute believes that the 'need' for a repeater is best judged by the Amateur Service and not the Licensing Authority.

**Equipment Requirements**

The technology used in repeater stations has undergone significant changes since repeaters were first introduced. This is evident not only in the receipt of an interrupted incoming signal exceeding a specified time limit. While there is no objection in principle to this requirement, difficulties exist in specifying an appropriate time limit. For instance, the time out on a Packet Radio repeater would need to be considerably shorter than that for an ATV repeater. Also, the time out requirements for a busy capital city repeater may be more stringent than those for a quiet country repeater. To avoid amending this paragraph each time a new mode repeater is introduced it would be better for the specified time to be left open, and a range of times be agreed as necessary between the Licensing Authority and the Wireless Institute.

The need for repeaters to identify themselves is covered in paragraph 5.11 (g). A variety of techniques are listed, with a view to ensuring that the repeater identification can be recognised by properly skilled and equipped operators. It is believed that broad guidelines only should be laid down, and that the repeater licensee be free to determine the most suitable and acceptable method. For instance, voice identification should be permitted for voice repeaters, ASCII identification for ASCII repeaters, and so on.

While recognising the responsibility to use the whole of the radio frequency spectrum in a responsible way, it must be remembered that repeater operators do not always have access to the latest commercially available test and measurement equipment. Thus, to impose the same technical standards on amateur equipment, as are imposed on commercial equipment, may result in insurmountable difficulties being placed in the way of some repeater licensees.

Accordingly, the Wireless Institute expresses some reservations about the paragraph describing the construction of a repeater (5.11 (b)) as being of 'high standard and in accordance with good engineering practice'. While this is a desirable aim, how will it be judged? For this to be done fairly and impartially, a set of standards would be needed. Use of commercial standards may pose difficulties in the light of the comments in the preceding paragraph.

The Wireless Institute has no desire to see equipment with poor constructional or operational characteristics licensed for the amateur service, but believes that the points raised in the preceding paragraphs should be further discussed with the Department of Communications.

**Operation on a non-interference basis**

Amateur repeaters have on occasions been required to be turned off when interference has been caused to them from nearby commercial equipment. Paragraph 5.11 (f) of the Regulations makes it clear any interference to amateur repeaters from other services shall be accepted, except where the interfering equipment is not operating in accordance with Departmental specifications. Determining the origin and cause of

interference to any radiocommunication service can be a time consuming process, especially on a site where many organisations provide varied services.

It is obvious that the reason behind this situation is the observation that amateur repeaters are built to a variety of unspecified 'standards' while commercial equipment is required to meet specified standards. It may be possible, therefore, if amateur equipment was to be subjected to testing against the commercial standards that the approach by the Department of Communications on interference could be varied.

However, the point made in the previous section, that very few amateurs have access to the test equipment necessary to make these measurements, is still valid. Accordingly, it is recommended that the issue of compliance with commercial standards for amateur equipment be discussed further with the Department of Communications on the basis that it be voluntary as far as the Amateur service is concerned, and that having been shown to comply with the standards, a repeater be exempted from the restrictive requirements of paragraph 5.11 (f).

Thus, the Wireless Institute or a repeater group could arrange for a specific repeater to be subjected to the necessary testing procedure, and when shown to comply, be subject to a variation in the regulations. It is considered that repeaters located on prime sites serving large population centres would be the likely candidates for this procedure.

**Use of specialised access control techniques**

Various techniques are available to control the access to repeaters. These include tone-burst, sub-audible control tones and tone squelch, techniques which are frequently used in commercial installations.

These techniques are usually used to minimise interference from spurious signals on the repeater input frequency, and to quieten receiver output until a desired signal is received. While these techniques are no doubt appropriate in a commercial environment, the Wireless Institute believes that use of these techniques should be left to the discretion of amateurs.

**Multi-mode repeaters**

Multi-mode repeaters represent an efficient use of repeater hardware and the frequency spectrum. There should, therefore, be support for such devices where the modes are considered compatible.

**CROSS LINKING OF AMATEUR REPEATERS**

As indicated in the opening section of this paper, repeaters are an enhancement of the amateur service. There are many ways that this enhancement can be achieved — by using new technologies and new modes, and by expanding considerably the service area of an existing repeater. A typical example of the last point is the expansion of the amateur satellite service where VHF/UHF contacts to countries halfway round the world are now possible.

**The Present Situation**

One technique for expanding the service area of a repeater is to link it to another repeater. This could be done for a variety of reasons — to carry a news broadcast to more listeners, or to provide coverage from an isolated country area back to a neighbouring town or city, or to link a population centre with its nearby recreational area.

Approval has been given by the Department of Communications for three particular instances of cross linking on a trial basis. These are:

- \* Tasmania — link to relay WIA broadcasts,
- \* South Australia — link city and country ATV activities, and
- \* Western Australia — link city and country voice repeaters where the country repeater serves an isolated stretch of highway north of Perth.

**General Guidelines for Repeater Cross-Linking**

The Wireless Institute believes that cross-linking of repeaters should be supported provided that certain conditions are met. The reason for the cross-linking should be consistent with the aim of enhancing the Amateur Service.

The following points are offered as guidelines for the licensing of linked repeaters irrespective of mode:

(a) Each repeater in the linked group is to be licensed individually according to the normal repeater licensing requirements. The cross-linking is to be the subject of a separate application. Further, approval in principle may be sought for any or all of the applications.

(b) Cross-linking of repeaters will not be permitted where such an arrangement allows an amateur to originate a signal on a band he is not normally permitted to use.

(c) Cross-linking may be either permanent, where all transmissions are cross-linked, or temporary for specific purposes, where only WIA news broadcasts or WICEN activities are cross-linked. If the cross-linking is for a temporary specific purpose, then it may be appropriate to modify some of the following conditions as indicated.

(d) The traffic and interconnecting signals for permanent cross-linking of repeaters are not to be carried in the same amateur band. While it is preferred that this band be a higher frequency band, it is noted that propagation characteristics of a particular location may require the linking to be done on a lower VHF/UHF band. Further, the link frequencies used must be in accordance with an approved Wireless Institute Band Plan.

Cross-linking of repeaters for a temporary specific purpose; eg a Wireless Institute Broadcast, will be permitted to use 'off-air' signals for input.

(e) Where the cross-linked repeaters are in different states, then approval of all the relevant WIA Divisions is required.

(f) The maximum number of repeaters to be cross-linked where simultaneous emission is used shall be three. Where the received traffic is stored before retransmission, eg in RTTY or Packet mode operations, or where repeaters may be selectively added to the link, then this limit does not apply.

(g) All ATV repeaters and links shall use vestigial side band emissions only for picture signals.

It is noted that further mode specific conditions may need to be applied from time to time to overcome difficulties that are being encountered or are foreseen.

**CONCLUSIONS**

The Wireless Institute believes that the present approach by the Department of Communication to Amateur Service repeaters and translators is generally satisfactory. This is shown by the ever increasing number of these devices that are being placed into service by the amateur fraternity.

However, there are a number of points arising out of the new regulations which require further discussion and consideration. Accordingly the Wireless Institute makes the following recommendations:

- 1 That the justification or need for a repeater is a matter for the Amateur Service to determine.
- 2 That the Wireless Institute develop and publish guidelines for the use of various modes of repeaters as required.
- 3 That the Federal Executive co-ordinate repeater license applications in accordance with a procedure to be determined.
- 4 That the Wireless Institute develop a set of maximum time-out periods for various modes and locations of repeaters and other technical standards as necessary.
- 5 That the Wireless Institute discuss further with the Department of Communications the effects of ensuring amateur repeaters meet specifications of constructional and operational standards with a view to minimising the effect on amateur repeaters when interference is being caused by other spectrum users.
- 6 That the guidelines proposed for the cross-linking of repeaters in the Amateur Service be approved.

If the above recommendations are accepted by the Department of Communications, then the enhancements they permit to the amateur service repeaters will allow amateurs to continue to experiment with new technology, and to provide valuable community service in times of need.

## THE NEXT STEP

Complete copies of Issue 3 of this paper have been circulated to all Divisions of the Wireless Institute. It is currently undergoing its final refinement, pending its presentation to the 1986 Federal Convention in April 1986. Any comments or suggestions should be made as soon as possible, either to your Divisional Technical Advisory Committee or to FTAC. This will enable them to be considered prior to the printing of the convention papers. It is not until the convention has considered this paper and voted to accept it, either in part or in full, that it will become WIA policy.

AR



Dick Butler, Secretary General ITU, addresses the opening of the Conference. Photograph courtesy BREAK IN



Ron Henderson VK1RH, Wally Watkins VK2DEW (partially hidden) and David Wardlaw VK3ADW. Photograph courtesy BREAK IN

# SIXTH IARU CONFERENCE OF REGION THREE

From the 13-17th November 1985, the sixth Conference of the Region 3 IARU Association was held in Auckland, New Zealand. Following is a brief report of the Conference and the speech delivered by Dick Butler, Secretary-General of ITU. A WIA delegation attended the Conference.

## FROM IONOSPHERE TO DEEP SPACE

I am very honoured to participate in the General Assembly of the International Amateur Radio Union Region 3 and to bring you greetings of the 160 Member States of the International Telecommunication Union — the ITU. I am pleased to see radio enthusiasts from so many countries present here in this beautiful city of Auckland.

The choice of venue for this year's conference I believe is especially appropriate, being situated in a country which has a remarkable record of contributions to the development of international telecommunications and which is encouraging radio amateurs to enjoy their hobby and to render service to the community. Amateur radio is, in fact, the only hobby provided for by international treaty, the Radio Regulations annexed to the International Telecommunication Convention.

The Radio Regulations define amateur radio as "a service of self-training, intercommunication and technical investigations carried on by amateurs, that is, by fully authorised persons interested in radio technique solely with a personal aim and without pecuniary interest". Radio amateurs belong to a group of devoted enthusiasts scattered all over the world. They have organised a network of radio communication that extends over the globe, probably the only system which can be correctly described as global.

Amateur radio began back in the early days of the art, when radio was known as "wireless". At that time, there was not the present sharp line of distinction between professionals and non-professionals, experimenters, scientists, engineers, hobbyists — all were amateurs.

On 8th December 1864, six months before the creation of the International Telegraph Union (which in 1932 became the International Telecommunication Union), Professor James Clerk Maxwell read a paper before the Royal Society of London on "A dynamical theory of the electromagnetic field". One section of this paper entitled "Electro-magnetic theory of light" set out the classical equations describing the relationship between light waves and the travel of electromagnetic disturbances.

About a quarter of a century later, Heinrich Hertz succeeded in generating radio waves a few metres in wavelength, and demonstrated their similarity to the shorter waves of light by their reflection and refraction properties. Within the next decade, Guglielmo Marconi in England, and Alexander S Popov in Russia, had started to use these waves for experiments in practical com-

munication. When, in 1901, Marconi demonstrated the transmission of radio signals across the Atlantic Ocean, it became evident that there was a need for scientists to understand and explain the propagation phenomena associated with such transmission round the curved surface of the earth.

In 1907, voluntary investigators conducted circuit tests on short waves to demonstrate that stable communications were feasible on wavelengths below 200 metres. These pioneers soon had many disciples but the amateur field was quickly appropriated by people fond of tinkering with equipment and interested in picking up transmissions from large broadcasting stations. Investigation was not confined to the old world.

Innovators, driven by the isolation of distance in Australasia, were also very prominent. Indeed in the last few days, some of you participated in the commemorative function to recognise the 75th Anniversary of the Wireless Institute of Australia the oldest of its kind in the world. Respect was given to the large number of radio pioneers whose scientific curiosity did much to develop southern hemisphere radio research and information.

Once broadcasting was no longer esoteric, people seriously interested in research — those who claimed that they alone were entitled to call themselves "radio amateurs" — concentrated on the study of shortwave propagation.

In 1923, radio amateurs really came into their own. On 26th November 1923, the French station 8AB and the American station 1MO set up the first bilateral communication across the Atlantic. This was done on a wavelength of 100 metres, even though most ambitious amateurs did not believe transmission below 180 metres was possible. The shortwave radio cult began that day. Enthusiasts banded together in ever increasing numbers and with an ardour that frequently bordered on the fanatical.

In the early 1920s it was discovered that the long-distance radio transmission which had been observed ever since the start of radio were due to radio signals being reflected back to earth from the ionosphere. This reflection process was, unfortunately, not simple. It was not as if there were a mirror up in space. The reflective properties varied continuously rather like the weather with recurring patterns depending upon the time of the day, the season and the level of the sun's activity.

These variations affected different frequency bands in different ways and as a result of this it

became necessary to share the high frequency bands in different categories of users such as the maritime services, broadcasting etc on a recurring basis throughout the spectrum so that each user category of service received a selection of frequency bands. This was necessary to provide a measure of continuous communications.

The point I want to make in bringing this early history to your attention is that the systematic division of the radio frequency spectrum, as we know it today, stems largely from the use of space — the ionosphere by radio communications.

In this regard, major contributions were made by radio amateurs in conducting research in radio technique, and in the properties of the ionosphere with comparatively simple apparatus. Radio amateurs were thus involved in the exploration of space long before the material used with the help of rockets and satellites, and well before the International Radio Conference, held in Washington DC in 1927 which drew up the first allocation table extending into the high frequency part of the spectrum. Subsequent ITU radio conferences evidently refined and amended the allocations made in 1927. The general World Administrative Radio Conference, WARC 79, took a large number of decisions for better sharing of the frequency spectrum. The conference also laid down long-term guidelines for the optimum use of the radio frequency spectrum. It drew up a program of future specialised conference to deal with specific services.

Only a few weeks ago the First Session of the World Administrative Radio Conference on the use of the geostationary — satellite orbit and the Planning of space services utilising it concluded its work in Geneva. I am glad to know that, as was the case on the occasion of previous World and Regional Administrative Radio Conferences, the IARU had again sent a delegation of radio amateurs to Geneva to follow the proceedings of this historical and extremely complex conference in its search for acceptable means of guaranteed access to the geostationary orbit. I am sure, too, that they made new friends for amateur radio among the representatives of ITU's Member countries.

Radio amateurs have built the series of OSCAR satellites and its successors and tried them out as soon as satellite communication was found feasible. Radio amateurs have served as a nucleus to bring about many advances in radio techniques and in the improvement of human relationships. This nucleus will grow in size and advance in level. Because they are amateurs, the only driving



force urging the world's more than 600 000 radio amateurs in their interest — interest in human contact and interest in improving their technique, which has as its ultimate objective the broadening of the sphere of this contact. It is a hobby which I should like to see introduced on a large level in as many ITU Member countries as possible. At the beginning of the electronic era many people are afraid of science and engineering, assuming they are difficult subjects beyond their grasp, but radio amateurs can show them otherwise by their own experience. Amateur radio clubs particularly in developing countries can interest laymen and young people in radio and, through radio, science in general.

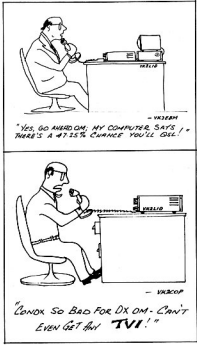
I urge you to share your amateur radio knowledge with your friends, with youngsters of your respective countries and to transfer it to the young generation of the many developing areas and countries of this vast Region 3.

ITU seeks your co-operation. Indeed, with the IARU we are arranging in 1986 a training course in the administration of the amateur radio service in Nairobi, Kenya, during September 1986 and on the eve of AFRICA TELECOM 86. We are exploring similar possibilities in Region 3.

Thank you once again for having given me the opportunity to address this meeting and to assure you of my continuing support. I am privileged to be the patron of the International Amateur Radio Club. Most of you have certainly had the opportunity to contact its international amateur radio station 4U1ITU at ITU Headquarters. You are welcome to operate this station whenever you come to Geneva.

In October 1987 the ITU is organising TELECOM 87, the fifth quadrennial World Telecommunication Exhibition and FORUM in Geneva. It is the world's largest and most prestigious telecommunication event. Floor space is available for an IARU pavilion. Why not make TELECOM 87 your rendez-vous for an eyeball QSO with your friends from other parts of the world. Operate 4U1ITU from Geneva. If you cannot be with us in Geneva meet us on the air. Plan special amateur radio events to highlight TELECOM 87 now. May I offer you my best wishes for the success of your noble efforts. Thank you Mr Chairman.

R E Butler  
Secretary General  
13th November 1985 Auckland



## SUMMARY REPORT

This report is a summary of the main business of the Conference giving information of a general nature.

The Conference was convened in collaboration with the New Zealand Association of Radio Transmitters (NZART), the host society which arranged for all secretarial facilities required for the Conference at the hotel including tape recording of the whole proceedings of the meeting.

The participants were delegates of 10 member Societies, viz ARRL, CRSA, JARL, KARL, MARTS, NZART, ORARI, PNGARS, RSGB, and WIA, the President, Vice-President and Secretary of IARU and four Directors, the Secretary and Assistant to the Secretary of the Region 3 Association.

Proxies were held for BARL by RSGB, HARTS by ORARI, PARS by JARL, SARTS by WIA, PARA by NZART, and BARTS by MARTS.

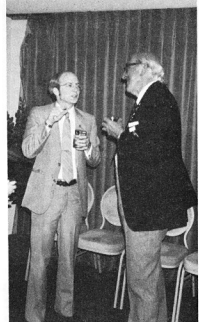
Both Region 1 and 2 were represented by their respective Presidents and Secretaries. The ITU was represented by R E Butler, Secretary General of the ITU.

Region 3 Directors' Meeting was held on the day prior to the Conference to deal with a number of administrative matters.

## OPENING CEREMONY

Terry Carrell ZL3QL, President of NZART, said that it was a great honour for New Zealand and NZART to host this Sixth Triennial Conference of the Region 3 Association.

Terry offered a special welcome to Chinese Radio Sports Association (CRSA) and Organisation Amateur Radio Indonesia (ORARI) as well as the other delegates. He noted with sadness the loss of WAKFC, HSIWR AND JA1NAT and asked those present to remember their efforts on behalf of amateur radio.



Jock White ZL2GX, NZART Contest Manager (right), talks with David Sumner K1ZZ, Executive Vice-President ARRL.

Photograph courtesy BREAK IN

Dame Cath Tizard, Mayor of Auckland, addressed the assembly and welcomed all Delegates, Observers, and guests to Auckland and wished the Conference well.

The Conference was formally opened by the Hon Jonathan Hunt, Post Master General/Minister of Broadcasting for New Zealand. Mr Hunt noted that this was the first International Radio Union Conference to be held in New Zealand and it was



The Directors of Region 3 meet (from left) Keigo Komura JA1KAB, David Rankin 9V1RH/VK3QV (Chairman), Jumbo Godfrey ZL1HV, Masayoshi Fujikawa JM1UXU, and Michael Owen VK3KI. Photograph courtesy BREAK IN

the first Region 3 Conference attended by the Secretary General of the ITU.

Mr Hunt welcomed all the overseas delegates to the Conference and noted that this was the first occasion that representatives from the People's Republic of China had attended an International Amateur Radio Conference. He said that amateur radio has a proud and honourable tradition of service to the community and of keeping itself in the forefront of technology.

Mr Hunt noted that without goodwill the amateur service would have difficulty in retaining its allocations. In his view it was a measure of the success of the amateur service in New Zealand that it continue to grow; that it catered for the wide range of people from all walks of life and age groups.

Mr Richard Butler, Secretary-General of the ITU, said that he was very honoured to participate in the General Assembly of the IARU Region 3 and brought to the Conference the greetings of the 160 Member States of the ITU.

Richard Baldwin W1RU, President of IARU, thanked the Mayor and the Minister for his support of amateur radio. He said that such support was important because New Zealand had been a staunch supporter of IARU since the very beginning and that this would continue for a long time. He also thanked the Secretary-General of the ITU saying that such support was critically important to radio amateurs. He said that it is from ITU Conferences that all of our privileges flow. The most necessary ingredient for radio amateurs was frequency allocations — to achieve these allocations amateur radio needed to be adequately represented and to participate in IARU Conferences.

Mr Baldwin noted the vast improvements in the relationship between amateur radio and the ITU in the last decade.

Mr D Rose, Assistant Director General of the New Zealand Post Office, addressed the meeting. He noted the special licences which had been issued to delegates from countries, many of which do not normally have reciprocal agreements with New Zealand. He said that New Zealand was proud to have helped to achieve a high status for radio amateurs around the world by its support of amateur radio at International Conferences. He wished the delegates a successful Conference.

The Minutes of the Fifth Regional Conference, held in Manila in 1982, were received and adopted. The formal reports submitted by the Secretary, individual Directors and member Societies were noted. In addition, the reports of Region 1 and Region 3 Secretaries were noted, as was that of the President of IARU.

## RECOMMENDATIONS AND ACTION

Working Group No 1 was set up "to review band plans previously adopted by the Association having particular regard to the 28MHz band and the position of Packet Radio, and other special modes, in any band plan and to recommend band plans as considered appropriate for the HF, VHF, and UHF bands".

Band plans were prepared and approved for 7MHz through to 1295MHz.

Concerning the 10MHz band, it was agreed that IARU Societies be encouraged to negotiate with their administrations for the use on a local non-interference basis of the 10.150-10.200MHz band, in order to indicate the need to administrations for an expansion of this band on a more permanent basis to meet the needs of the amateur service.

All Societies were encouraged to take appropriate action to ensure that the transfer procedures for the WARC 79 bands were completed by 1st July 1989. In addition, where the WARC 79 bands were not yet allocated, to continue the work necessary to gain access to these bands.

Working Group No 2 was set up "to draft one or more resolutions as are considered appropriate to express policy in respect of the following general areas:

1 participation of the amateur service and the amateur satellite service in currently scheduled ITU Conferences and appropriate funding required

2 the position or preparation of a position for the amateur service and amateur satellite service in respect of frequency and regulatory matters for administrative purposes, the need to protect the services, and the advancement of the position of the services to include representation, and materials for such purposes, and participation in the activities of appropriate organisations.

VK3ADW (WIA) was appointed Convenor, with ZL2AZ (NZART), W1RU (IARU President), 9V1RH (Region 3 Chairman of Directors), and 9M2SS (MARTS) active as members.

Ideas brought up during the Working Group discussions included the following:

**AMATEURS ON ITU DELEGATIONS** — There are two possibilities:

i An amateur who is part of a Delegation in his profession or job capacity. NOTE: such a person may be somewhat limited by the "modus operandi" of his leader and/or delegation.

ii An amateur financed by his IARU Society and who is officially included in the Delegation for the purpose of representing the amateur service. NOTE: may be limited as in i above, but usually not to the same degree. Possibility ii is the preferred situation to work for and we recommend that Member Societies be encouraged to achieve this end.

**PARTICIPATION** —

i In Preparatory Conferences — SPM

etc

ii In the work of the CCIR.

iii At ITF Forums that are open to the IARU.

**PRESENT APPROPRIATE PAPERS IN THE ITU JOURNAL.**

**IDENTIFY POTENTIAL CHAIRMAN OF ITU WORKING GROUPS AT WARC/RARCs** and ensure that these people are fully briefed in matters concerning amateur radio. Also similarly identify and brief other influential IARU and National Administration officers.

Five resolutions concerning these matters were passed. The first concerned the importance of Region 3 Association observers at ITU Conferences. The second concerned a future possible General WARC and the development of goals and objectives. The third concerned the initiation of a continuing program to ensure worldwide support for the interests of amateur radio before and at future ITU Conferences.

The fourth encourages the continuing participation of the IARU in the work of the CCIR.

The fifth concerned the Regional Administrative Radio Conference to "establish criteria for the shared use of the VHF and UHF bands allocated to the FIXED, BROADCASTING, and MOBILE SERVICES in Region 3" sometime in 1987/88. And indicated that this conference maybe of such importance that the highest level of participation will be required, including amateurs on national delegations.

Suggestions as to the funding required were also put forward.

Working Group No 3 was set up to "review the Constitution and Bylaws of the IARU and to



**FROM LEFT: Fred Johnson ZL2AMJ, new Director IARU Region 3, Terry Carrell ZL3QL, Chairman of Conference and President NZART, and Pedro Siedeman YV5BPG, IARU Region 2.**

Photograph courtesy BREAK IN

recommend to the conference a policy in respect of the Constitution and Bylaws of the IARU, including the amendments, if any, considered desirable".

G3GVV (RSGB), was appointed Convenor with ZL1HV (NZART), VK3KI (Region 3 Director), VK4ZXZ (WIA), and JA1AN (JARL), acting as members.

This working group reported that having considered the papers submitted to this Conference, and Resolution 84-3 of the Administrative Council, it is considered that amendments to the Constitution and Bylaws of the IARU are desirable.

In proposing amendments and matters for further consideration, certain Principles have been adopted —

Changes should be made to the Constitution and Bylaws of the IARU bearing in mind the following Principles —

a The language used should be clear, unambiguous and consistent and used bearing in mind that English is not the first language of many that will use the documents;

b Whilst it is highly desirable for Member Societies to be members of the appropriate regional organisation, this should not be mandatory;

c Member Societies should have the right to make proposals to, and otherwise deal with the IARU and not necessarily exclusively through a regional organisation;

d The Constitution should put beyond any doubt that the supreme authority of the IARU lies with its Member Societies acting collectively, and appropriate means should be provided in the Constitution for that authority to be exercised effectively, particularly to meet an urgent need;

e To meet the need referred to in (d), provision should be made to permit a plenary meeting (whatever called) to be convened, but only if required by sufficient Member Societies, representing sufficient radio amateurs;

f The provisions relating to the appointment of the President and Vice-President of the IARU should be amended to put the procedures necessary for such an appointment beyond doubt.

The following resolution was passed. NOTING Resolution 84-3 of the Administrative Council inviting suggestions for improvement to the Constitution and Bylaws of the IARU. RECOGNISING that there is a real need for the improvement of the Constitution and Bylaws. RESOLVES to recommend the adoption of the amendments, set out in the copy of the Constitution and Bylaws annexed to this Resolution. RESOLVES to adopt the Principles set out in the Report of the Conference Working Group annexed to this Resolution. RESOLVES to request the Administrative Council to circulate this Resolution and the documents annexed to this Resolution.

The amendments proposed were entirely in line with those contained in the joint WIA/NZART position paper presented at the Conference.

The Conference agreed that Societies would

publish appropriate guidance to their members to engender a wider understanding of the appropriate practices concerning the exchange of GSL cards.

It was agreed that the Directors of Region 3 appoint two representatives to the Administrative Council, before each meeting of the Administrative Council, having regard to — the desirability of selecting representatives with the appropriate skills, the availability of the proposed representatives to attend the Meeting, the need for continuity of representation and the desirability of giving broad IARU experience to those actively involved in the affairs of the Association.

It was agreed that amateur radio entry standards continue to be studied with a view to producing an IARU guideline.

A Study Group, initially consisting of six persons was set up to consider legislation for the amateur licence and amateur operation.

The Association formally thanked JARL for the publication of REGION 3 NEWS over the past three years.

Working Group No 4 was set up "to report to the Conference a decision if any, that could be desirable for the Conference to make in relation to amateur satellites, having regard to papers submitted to the Conference".

Resolutions involving amateur satellite co-ordination and financing were adopted by the Conference.

Working Group No 5 was set up "to provide a report to the Conference identifying the most appropriate means by which amateur radio can be encouraged and promoted by the Association and its member Societies", to provide assistance to developing countries.

It was agreed that a needs and resources available questionnaire be completed by Member Societies.

Member Societies will endeavour to limit the use of special call sign prefixes to national or international events or amateur radio events of an outstanding nature.

It was agreed that in addition to the "Human Language System" developed by JARL, the IARU (Region 1) International Locator System, often referred to as the Maidenhead Locator System, be adopted by Region 3 Societies.

Region 3 adopted ARDF rules based on the Region 1 rules. This matter will be reviewed at the next Region 3 Conference.

It was further agreed that Region 3 Member Societies encourage the promotion of ARDF activity in the Region, noting that it is an activity which should appeal to young people.

The rules of the Region 3 Award have been updated to take account of the new Societies which have recently joined the Union, and the USA and UK possessions in Region 3.

It was also agreed that the number of countries for the Gold and Silver endorsements be increased but the basic certificate qualification remain unchanged.

The IARU Region 3 Association adopted, in principle, the Region 1 HF emergency procedure.

It was agreed that Region 3 adopts the recommendations of the Monitoring System Study Group and it was also agreed that NZART, WIA and JARL collectively nominate to the Directors of



**Guy Minter VK4ZXZ becomes a magician's assistant for magician Yutaka Kasahara JA1CLN at the JARL Reception.**

Photograph courtesy BREAK IN



# AMATEUR RADIO — FUTURE DIRECTION A discussion Paper

A Discussion Paper Compiled by  
Jim Linton VK3PC  
Roger Harrison VK2ZTB

This paper is intended as a starting point for dialogue and discussion for overcoming the downturn in amateur radio and to ensure its long-term survival.

The current level of youth involvement is extremely low. In the 21-35 age group it is lean and insufficient people age 50-plus years are entering the hobby.

There has never been a serious exploration of all possible ways to increase amateur radio's attractiveness and relevance in an increasingly technological society.

Questions addressed in this paper include making amateur radio more dynamic and relevant to expanding technology, increasing the number of entry points, and lifting the level of youth involvement in the hobby.

It puts a reasoned argument for giving Novices data communication privileges — a need already recognised and supported by the American Radio Relay League (ARRL) for the US situation.

In addition to enhancing or upgrading the existing Full, Limited, and Novice licences, this paper argues for the introduction of a new licence giving VHF/UHF Multi-modes.

A telephony licence for beginners on VHF/UHF is also advocated as an additional entry point into the hobby, similar to the successful Japanese telephony licence.

The sooner these changes are made — the sooner Australian amateur radio can get out of its current stagnation, and increase youth, adult, and retired person's participation in the hobby.

## INCREASING THE HOBBY'S ATTRACTIVENESS

All possible avenues of greater participation in our hobby and ways to make it more relevant to the target range of people should be explored to ensure its long-term well-being. The hobby needs to be made meaningful for a whole new untapped generation of computer hobbyists, which includes large numbers of teenagers and primary school children. At the same time it should have increased attractiveness to the growing number of technically educated and stimulated people in our community.

Amateur radio needs to be both more dynamic and relevant to the computer, information technology, and satellite communication age for it to be a desirable progression for computer hobbyists, technicians, and engineers. Among these people are innovators and experimenters who would be an asset to amateur radio.

The emerging computer technology should be married to amateur radio for the fullest possible benefit of the hobby. However, the current novice licence, with its operating privileges, is neither attractive to the large and growing pool of computer hobbyists, nor very attractive to the technicians and trainees in various electronics related fields.

Computer hobbyists cannot use their computers on the novice amateur bands — and technicians types see the Novice (in fact, some wrongly perceive amateur radio generally) as only a voice hobby communication medium, similar to CB radio. The present licensing system does not give them suitable entry points.

## COMPUTER HOBBYISTS AND COMMUNICATIONS

Computer hobbyists are showing an increasing interest in 'digital' communications via radio. During my term as Editor of ETI, I saw convincing evidence of this. In the 1983 issue of ETI, I published a project contributed by Tom Moffat VK7TM — the ETI-733 Radio Teletype-to-Computer Converter. This is a simple to build, receive-only project designed to attach to the parallel I/O port of the Microbee. Frankly, at the time, I regarded it as a special interest project only. How wrong I was! It was an instant success and to late 1984, something in excess of 3000

were sold! (Judging from actual sales figures of the PC boards). Such sales put the project in the 'good seller' category. Of the feedback received on this project, a high percentage was from non-amateurs.

In the September 1983 issue of ETI, I published another project of Tom Moffat's, the ETI-736 FAX decoder. Having learned from the early success of the ETI-733 RTTY decoder, this time I made it the feature project. The result was similar. Again, a significant proportion of reader feedback came from non-amateurs.

The feature project of the first issue of AUSTRALIAN ELECTRONICS MONTHLY was the 'Listening Post' (AEM3500), once again by Tom Moffat, and with software to suit the Microbee to decode Morse/RTTY and FAX. Kit retailers report this is the most popular of the AEM projects to date, bar none, even exceeding the success of the earlier ETI projects.

Whilst I haven't attempted to collect comprehensive reader feedback statistics I would say the non-amateur feedback exceeds the amateur or communications enthusiast feedback. With this project, the demands for us to publish software for computers other than the Microbee has been staggering.

While at a school function in mid-1984, my wife and I got talking to another parent and we discovered his boy and our two boys had an interest in common — computers! (No surprise there). This interested me had contacted 50 telephone 'contacts' via modem just that week and (having only recently obtained a modem) suggested our boys arrange contact. Telephone numbers were exchanged.

Now doesn't this have a familiar ring to it? (Pardon the pun).

My eldest son and I have rung up a variety of telephone numbers around the country on occasion, and we are Vialat subscribers.

One thing we have noticed — it can be murder trying to get onto popular bulletin boards and Vialat some days in the afternoon after schools out (ie between 4-6pm). I don't know how frequently the bulletin board 'mailbox' facilities are used, but from asking around they are popular and it appears telephone 'contacts' between computer hobbyists are seemingly an everyday event.

The inevitable course of technological hobbies is for the hobbyists involved to gradually advance their knowledge and techniques and the expand their fields of endeavour. That is, unless either a social, governmental or technological barrier prevents further growth.

On that basis, it seems to me that computer hobbyists, taken as a group, will find packet radio, RTTY, AMTOR, FAX, ATV and digital satellite communications of interest at some stage. Certainly, the evidence is there that some at least have already evinced an interest in a few of these areas.

## HAS AMATEUR RADIO A FUTURE WITHOUT EMBRACING COMPUTER TECHNOLOGY?

Put yourself back to the immediate post-WWI era (hindsight has 20-20 vision, remember), when spark transmitters and coherers reached their zenith. Re-check that question to: 'Is there a future for amateur wireless if it fails to embrace vacuum-tube technology?'

Technologies appropriate to solving technical or technological problems have always been adopted in groups of technical people where freedom to choose the appropriate course have been the order. Witness the adoption of SSB by the amateur fraternity. It was adopted owing to pressures of a technical imperative — overcrowding on the HF amateur bands. Indeed, the amateur service was the first communications service in the world to wholly adopt SSB as a communica-

tions mode where it was most necessary.

Take a case closer to home: the Australian VHF/UHF repeater system. Repeaters sprang up among a special interest group within the amateur fraternity. They were already a necessity for commercial mobile operation at the time (late 60s), and their technical advantages for mobile operation are well-known. However, because the early amateur repeaters on-air were initiated by disparate groups in widely separated areas, no common technical standards regarding actual frequencies, channel spacings and input-output frequency spacings were set down prior to their establishment.

That was the 'experimental' phase. When they began to proliferate and demand for more repeaters arose, a technical imperative forced a change on the status-quo and nation-wide standard channels and input/output spacings were subsequently introduced.

It is our contention that amateurs will face a number of imperatives, both technological and social, in the not too-distant future and computer technology is something that will impose imperatives which we must face. It is the part and parcel of a larger subject on what the future holds for amateur radio, a subject on which VK2ZTB has written about and been lecturing on, to clubs and other amateur groups, for some three years now. (See 'Amateur Radio and the Face of Change', ETI, May 1984).

We think that the integration of the micro-computer into the amateur station will probably prove the catalyst that sparks off a new round of technological advancement within amateur radio. It will happen (has been happening) in simple ways at first. The adaptation of the new to the old-Morse and RTTY operation being prime examples here. Packet radio is seen as the next step, but is built in to its infancy. And the computer (or microprocessor system) is becoming part of the station 'system tools', aside from part of the communications process. Log-keeping and antenna control are but two simple examples.

## BRIDGING THE GAP BETWEEN COMPUTER HOBBYISTS AND AMATEUR RADIO

The tentative framework for such a bridge already exists. An interest in computer communications is quite strongly evident among computer hobbyists as they are the major purchasers of low-cost modems and the major customers of 'freelance' bulletin boards and non-business, free access data-bases. As evidenced earlier, magazine articles which marry radio communications and home computers are among the most popular items sold by electronics kit and component retailers and a significant proportion of the purchasers of such projects are non-amateurs.

We believe that bridge should be 'built' from both sides. That is, on one side amateurs should be encouraged more to embrace computers and computer technology and to integrate such with their communications activities. The growth of packet radio and computer-RTTY/CW will aid this, but there are other avenues as has been shown.

There is already considerable adaptation of computer technology among amateurs and suitable promotion (not just 'salesmanship') could accelerate this by bringing more attention to the what, the where, and the how.

On the other side, the amateur radio fraternity could promote itself among computer hobbyists. A small number of radio amateurs run bulletin boards and that seems like an excellent avenue. Articles in computer hobbyists publications on computers — in-communications from a radio amateur standpoint — provide another (ideal) avenue and good example already exist.

## HOW BIG IS THE TARGET?

We can get an idea of the size of the target audience — computer hobbyists — by, firstly,

looking at sales of 'home' computer (ie non-business) systems in Australia over the past, say, five years.

In 1984, Commodore reported that their sales figures, after about three years in Australia, exceeded 250 000 units, the lion's share being VIC-20s and C-64s. Apple's Technology (now Microbes Systems) launched the Microbes in March 1982 and by June 1985 reported sales of some 50 000 units here. A proportion of these went to education establishments and estimates put sales to hobbyist purchasers are around 20 000. In mid-1983, Dick Smith Electronics introduced the V2-2000 home computer. By the end of 1984, I understood in excess of 30 000 had been sold. The Sinclair ZX80 and ZX81 computers were marketed here from 1980 through 1983, some 100 000 plus units being sold, I understand. The Dick Smith 'Super-80' kit computer, introduced in 1981, sold some 4 000 to 5 000 units over a period of about 18 months, I believe. The ETI-680 project computer, described in 1981, sold a total of around 3 000 units over the following two years.

I can't recall, or find, sales figures for computers like Dick Smith's Wizard, the various Atari models, the Intellivision, the Sega, the various Tandy TRS-80 home computers, Amstrads, Apples, etc.

However, add it up and you are looking at a figure close to half a million units. Even that is probably conservative. It is not to say that that means half a million people own home computers. There are families with multiple computer systems.

\*Computer sales comment by Roger Harrison

## BENEFIT OF MORE ENTRY POINTS ALREADY SHOWN

The Novice licence introduced a decade ago provided an entry into the hobby for many of today's active radio amateurs. It was attractive to many of those initially attracted to CB radio who would not otherwise have taken the step towards amateur radio if the starting level had been the AOCIP.

The Novice licence gives a direct stepping-stone to the AOCIP — as shown by the estimated 70 percent who have upgraded. This grade of licence has given, for the first time in Australia, a 'Beginners' level of entry into the hobby. It provides an entry into amateur radio to those who otherwise, due to various reasons, could not achieve the AOCIP — while also attracting many others with AOCIP potential to take the first step.

The limited licence did a similar thing when introduced in 1952, but it also lured those purely interested (satisfied) with the scope available with a VHF/UHF licence.

## THE FUTURE IS DIGITAL

Digital techniques are more than just character communication, a progression from Morse code and teleprinter.

It goes deeper than being able to store and retrieve messages, such as with bulletin boards. Probably the most commonly known of emerging computer technology is packet radio — faster than RTTY and provides error-free transmission.

It is also character communications, and information transfer, and has demonstrated how experimenters can advance the radio art.

Packet communications did not originate in the amateur radio service, but we have taken the basic idea and shaped it into things that didn't exist before, or which have a slant different from what has been tried.

The traditional amateur radio touch had been added — extremely low cost.

In fact, amateur designed and built packet radio controllers have been adopted by the US Army and Navy, and are now finding their way into commercial applications.

Information transfer via packet and amateur satellites is another development.

Experimentation with non-character communication has just started — it is an area of experimentation ideally suited to amateur radio.

For example, take two Slow Scan TV units with digital outputs, plug them into packet controllers, and send absolutely error-free pictures.

Digitally techniques used for SSTV also enables

pictures to be stored digitally and retrieved at any time.

Digitised voice can be sent over packet radio. Several voice repeaters could share the same high-speed digital network for repeater linking.

Using packet techniques and digital compression technology, medium-scan television that approaches fast-scan quality can be sent over high-speed packet nets with other traffic.

## INTRODUCING A NEW LICENCE GRADE AND UPDATE THE NOVICE

A new licence grade, below the Limited licence level, could have a theory syllabus at the current Novice level, plus elementary theory areas of FM and Advanced Modes. This Intermediate (Digital) licence should give access to VHF and UHF; with appropriate bands and power limits. Telephony, repeaters, and specialist techniques including RTTY, ASCII, Packet, and Satellite operation could be permitted.

Using the Novice trend as a guide, a significant percentage of those entering the hobby via this new licence would upgrade. They would have a stepping-stone to the Limited Licence. It should capture the imagination of not only computer hobbyists but those training or employed in computer and communications-related fields.

The Novice licence should also be enhanced with the same VHF/UHF operating privileges, with the addition of data communication privileges on 10 metres.

An enhanced Novice licence could have the same theory syllabus as the new Intermediate licence proposed above.

## SUMMARY SO FAR

1 The Current Novice-to-AOCIP progression is not suited to the potential target group.

2 Amateur radio has much to offer computer technology hobbyists and other technically involved people but the current entrance step, the Limited licence, is a disincentive because of the quantum jump in technical radio knowledge needed.

## SOME QUESTIONS AND ANSWERS

Q: How does the proposed new Intermediate licence theory paper align with the current Novice exam?

A: Retain the current Novice syllabus plus additional VHF/UHF/Advanced Modes Unit. With the enhanced Novice concept the same theory exam paper could be used for both the Intermediate licence grade and the Novice.

Q: What frequencies, power levels, and modes for the new licence?

A: Segments, or all of the 144 and 432MHz bands, with power levels similar to the current Novice limits and all modes. An adequate delineation must be made to encourage upgrading to the Limited licence.

Q: What are the progressions from the Intermediate licence grade?

A: Up through the theory exam to the Limited, or sideways through the CW exam to the Novice.

Q: Why also add data privileges to Novices?

A: Additions to the syllabus would not destroy its purpose of being a beginners licence. The AOCIP theory exam usually has only one question on advanced modes, covering such things as ATV and SSTV bandwidths, RTTY duty cycle, how repeaters repeat and transponders transpond, and what is ASCII. Elementary theory of advanced modes and frequency modulation would not have a significant or detrimental impact on the Novice syllabus if the knowledge standard was set at the existing level.

Q: With Novice enhancement would existing Novices have to be re-examined?

A: This would not be necessary — the ARRL with its proposed Novice enhancement would automatically give existing licensees the new privileges.

Q: Would DCC consider another grade of licence?

A: Why not? All it needs is a further theory question bank on VHF/UHF/Advanced Modes at the elementary level.

Q: Would DCC enhance the Novice licence?

A: The Department would respond to enhancement proposals that had support.

## RECREATIONAL AND EDUCATIONAL ROLES OF AMATEUR RADIO

The hobby can play an important part in our present-day society. With increasing leisure time it is an ideal pursuit for all age groups.

Instead of engaging in potential loose-end activities and associated trouble, youth development can result from involvement in amateur radio.

Teenagers, adults, families and the retired find amateur radio opens up a whole new world to them.

Their horizons are widened, and they make new friendships.

Many things have been said about the need for Australia to embrace rapidly expanding technology.

Industries are aware that without increased use of technology they will fail to reach world markets due to their uncompetitiveness.

A community grass-roots awareness of technology is one benefit from amateur radio.

Industries can help individuals to make a contribution in their workplace by more easily adapting to new technology, or by suggesting ways it could be better used.

As part of the education system amateur radio can be used to teach in a practical sense a number of subjects. These include mathematics, science, social studies, geography, and other studies.

Students at schools with an amateur radio station, by talking over the air-waves, develop their speaking, communicative and other life skills.

## A TELEPHONY BEGINNERS LICENCE

This licence has been deliberately separated from the foregoing arguments in support of Novice enhancement and a new multi-mode Intermediate VHF/UHF licence to avoid confusion between the different concepts, but it fits in with the theme of this paper for more entry points into the hobby.

A 'Telephony' Beginners licence should be introduced to give access to the hobby using segments of the 144MHz and 432MHz bands. The theory syllabus could include elementary subjects at a Novice level, without HF and telephony specifics, but VHF/UHF specifics. Candidates would be examined on the necessary elements of basic electricity, magnetism, RF generation, modulation, propagation and interference.

In addition to a Telephony Beginners licence would be up to the Intermediate licence grade, or with also CW to the enhanced Novice. This licence grade would be attractive to raw beginners who could truly be a part of amateur radio starting with a foot on the bottom step of a stair case with the top being the AOCIP.

In Japan, a telephony licence has been recommended for introducing thousands of newcomers to the hobby. These are the same radio amateurs most of us speak with on 21MHz daily — showing this class of licence has attracted beginners who are true amateur radio enthusiasts.

With such a licence in Australia we would be looking at similarly-attracted large numbers of newcomers of the hobby.

A Telephony Beginners licence would easily fit into school curriculum as an elective subject — or could be readily tackled by mature-age enthusiasts. It would be ideal as an 'achievement badge' for the scouts, guides and other youth groups.

## RESTRUCTURING THE LICENCE SYSTEM

The authors of this discussion paper feel a restructuring of the existing Australian licensing system to afford more entry points and more opportunity for experimentation would contribute to a significant revitalisation of the amateur radio service.

We propose four steps to achieve this:

1 Introduce a 'new novice' licence to provide for telephony-only operation on the 70cm band following successful completion of an elementary theory paper, and the standard regulations exam.

2 Enhance the current novice licence to add VHF/UHF/Data privileges. The enhanced Novice is in fact an updated Novice licence for the 1980s and beyond (similar to that



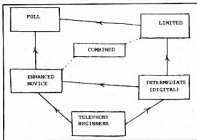
supported by the ARRL — see appendix 1).

3 Introduce an Intermediate (Digital) licence with enhanced Novice-type privileges on VHF/UHF.

4 Remove the 'defined mode' restrictions on the AOC and LAOC to permit experimental freedom with 'new' transmission modes. Increase the power output limit. Permit unattended operation by AOC and LAOC licensees.

With regard to 4... Experiments with 'new' transmission modes, whether currently invented or yet to be devised, would be encouraged. The only limitations necessarily imposed would be those that may be required by the ITU or local DOC in certain portions of the spectrum and by 'gentleman's agreement' within the amateur fraternity. In other words, what we did in-band would be totally 'our business', provided out-of-band emissions met the appropriate standards (as now more-or-less exists under the new Radiocommunications Act). Unattended operation (remote control of a station) would be an integral part of the experimental, public service, and emergency communication aspects of the hobby.

With regard to 1, 2, and 3, this may pave the way for a market for locally manufactured transceivers.



**Restructured Licence System Block Diagram**

## ARRL PUSHES FOR YOUTH, EXPERIMENTATION AND GROWTH IN AMATEUR RADIO THROUGH NEW NOVICE PRIVILEGES

The ARRL has proposed that US Novices be given increased privileges.

Currently they are confined to CW on HF but the ARRL wants them to have phone, digital modes, repeater access, 220 MHz and a segment of 1.2GHz.

Support for this 'Novice Enhancement' among ARRL members was four to one in favour.

Resistance to granting Novices SSB came from those in fear of CB-type operation being transported in the amateur radio service.

But this resistance was fading away because of the experience (exposure) US radio amateurs had when working many VK-Novices on 10 metre phone during the last sunspot cycle peak.

Some of the points put forward by the ARRL in support of increased Novice privileges are curiously the same as developed by the authors of this paper prior to awareness of the ARRL suggestions.

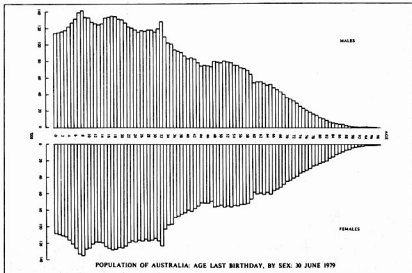
ARRL Executive Vice-President, David Sumner K1ZZ (editorial QST July 1985) said: "By giving beginners (Novices) the chance to hook home computers to a amateur rig, we can tap a promising source of prospective radio amateurs."

"Making the Novice licence relevant to the interests of young people is an essential step if the amateur radio service is to continue, in future decades, to fulfill its basis and purpose."

"The majority of today's Old Timers started in amateur radio when they were teenagers, or younger."

"This early opportunity for hands-on experience with telecommunications technology and concepts shaped many careers and interests in later life, which in turn has benefited the nation immeasurably."

The particular privileges being proposed for Novices represent a balance between a number of conflicting considerations.



"Ten metre phone and data privileges will permit Novices to pursue these activities... but are not so attractive as to discourage upgrading."

"We envisage 10 metre gateways to the packet radio market network, to permit Novice participation in this burgeoning activity."

"The sooner we can make amateur radio more attractive to newcomers, without compromising the entrance requirements which are so important in maintaining a quality service, the sooner the future of amateur radio will be assured."

## DEMOGRAPHICS OF AUSTRALIAN RADIO AMATEURS

Many of today's Old Timers started in the hobby when they were teenagers, but the number of teenagers in the 1980s is very low.

Of course, this situation is due to more than one factor, but an increase in the attractiveness of amateur radio to a wider range of age groups as proposed in this paper will see increased teenage participation.

A 1984 survey of WIA members showed the following demographics:

AGE GROUP	PERCENTAGE
Below 20 years	1
21 — 30	8
31 — 40	20
41 — 50	18
51 — 60	23
60 and over	29

The survey sample was 5 000. Those aged 50 or over represented 52 percent while in the 30 or under age group it was a mere nine percent.

Compare this with the demography of Australia's population, as depicted in the following Australian Bureau of Statistics graph.

On a population basis there are many more people in the 30 or under age group, and fewer, 60 and over — the reverse of the amateur demography.

**Population of Australia: Age Last Birthday, by Sex, 30 June 1979.**

## OBSERVATIONS ON THE IMPACT OF COMPUTERS

They are increasingly part of the school curriculum from as early as second grade primary.

Short introductory classes and more in-depth courses on computers are very popular because so many people have a thirst for computer technology knowledge.

More than 40 magazines dealing with computers are available in Australia at newsagents, general electronics magazines also contain computer technology articles.

Sales of computers for domestic use are increasing, due to falling prices. They are

gradually becoming either a necessity or convenience for education, work, and for modern data life-style service needs.

Micro-computer clubs have formed to provide a forum for the interchange of ideas and knowledge. They are self-help groups — much in the same way as the amateur radio fraternity traditionally has been.

A revolution is clearly evident in which mechanical operation is being replaced with new technology. Industry recognises it has to adopt new technology to survive.

Conversion of the keyboard written word into synthesised speech has reached a sophisticated stage. Digital storage of speech, is existing technology. Readily converting ordinary human speech into the written word is a reality, practical applications are not far away.

Digital developments in communication and information systems are at the frontier of technology and experimentation.

## THE AUTHORS:

Jim Linton VK3PC, has been the Victorian President and Public Relations Officer of the Wireless Institute of Australia for three years. An interest in shortwave listening and amateur radio saw him join the WIA as a Junior Associate, in 1962. Obtaining a Novice Licence eight years ago, and immediately upgrading to obtain the AOC for which he had been earlier diverted. A journalist for 15 years, his special interest is promoting the hobby.

Roger Harrison VK2ZTB, began as a shortwave listener in the NSW Division in 1962, and moved to the Victorian Division in 1963. First licensed as VK3ZRY, in 1963. Written extensively published articles both locally and overseas. Twice winner of the Higginbotham Award for the WIA's AR magazine. A professional technical journalist since 1976, he has edited the journals EUP, CB AUSTRALIA, ELECTRONICS TODAY INTERNATIONAL, and now AUSTRALIAN ELECTRONICS MONTHLY. Special interests include VHF/UHF techniques, propagation and 'Technology in the Future'.

Work on this paper began in early 1985 and was completed on 7th December 1985.



## WILL WE GET AN ASTRO-RADIO AMATEUR?

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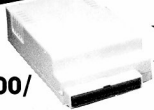
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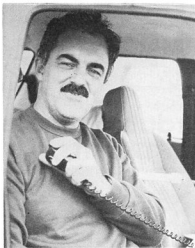
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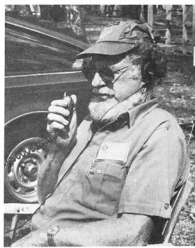
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AR86

# Band Planning for the High Frequency Bands

Ron Henderson VK1RH

171 Kingsford Smith Drive, Melba, ACT. 2615

A previous article discussed the philosophy behind band planning but deliberately raised only a few of the wider considerations requiring resolution by the amateur community.

This article, devoted to consideration of the high frequency amateur bands, considers the issues arising in some detail and presents draft band plans, in pictorial form for consideration, comment, adjustment and finally endorsement by Australian amateurs.

Before considering each particular band, the concept of an overlaid band plan should be explained. We commence with the amateur allocation as a slice of the total electromagnetic spectrum, as shown in Figure 1a. This allocation can be divided into a telegraphy-only segment and a joint telegraphy/telephony segment. For ease of definition let us call these the CW segment and the CW/wide band mode segment. Note that our basic Gentleman's Agreement, that CW is permitted across the full band allocation whilst the wide band mode has a narrower allocation; is preserved by layering the wide band mode segment on top of the CW allocation as in Figure 1b.

Within this basic division provision can be made for further bandwidth requirements, again built up as layers on the original CW/wide band delineation. Narrow band modes appear as a sub-division of the CW segment and effectively reduce the CW only allocation through super-positioning as shown in Figure 1c.

Finally, the band plan can be developed further by addition of yet another layer devoted to specific application considerations, such as weak signal working, beacon bands, FM simplex, and repeater allocations. These are demonstrated in Figure 1d.

**Development of an Overlaid Band Plan — The stages in the development of an overlaid band plan are shown diagrammatically below. NOTE: This is for illustration and does not resemble any band (perhaps it is nearest to 144-148MHz).**



Figure 1a.

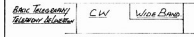


Figure 1b.

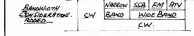


Figure 1c.



Figure 1d.

Before proceeding, it is necessary to establish some definitions applying to modulation mode bandwidth. The WIA Call Book states that: "The following terminology has been adopted for the purpose of the Australian Band Plan."

1 CW Only

2 Narrow Band Modes (other than CW) — for example occupying bandwidths less than 2.5kHz such as ASCII, Baudot (RTTY), AMTOR (ARG FEC) and Packet Radio.

3 Wide Band Modes — such as for example SSB, FM, FAX, SSTV, and data transmissions at greater than 300 Baud.

By contrast, the IARU bandwidth interpretations are:

a Phone operation includes SSTV, FAX, and modes with similar bandwidths not exceeding 6kHz.

b NB designates narrow band modes including CW, RTTY, Packet Radio, and modes with similar bandwidths not exceeding 1kHz.

c WB designates wide band modes including FM.

The WIA Call Book definitions have been used for the remainder of this paper, even though they may require updating.

The term "exclusive allocation" indicates a single allocation to the Amateur Service in Australia. It does not take into account assignments which may be made in other countries to other services (the 7.000-7.100MHz and broadcast station problem is an illustrative example).

Having set the scene by explaining the overlaid band planning approach, it is time to turn to specifics. In the HF band plans that follow, very few features are new or innovative, but a few do aim to clarify current misunderstandings. The basic CW/wide band mode delineations are generally not altered, except perhaps by the insertion of a narrow band segment. The amateur band status, as indicated by the Australian Table of Frequency Allocations, is also included for information at the foot of each figure.

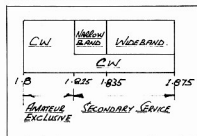


Figure 2. 1.8MHz

The 1.8MHz band, as shown in Figure 2, is quite straight forward with the narrow band mode segment layered between the CW and wide band mode assignments.

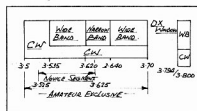


Figure 3. 3.5MHz

The 3.5MHz band, as shown in Figure 3, is similarly straight forward except for the addition of the DX window between 3.794 and 3.800MHz. The

narrow band segment is overlaid in the wide band assignment from 3.620 to 3.840MHz. This provides minimum intrusion into the Australian novice segment, yet is adjacent to the Region 1 telephony allocation of 3.580 to 3.620MHz. As yet, Region 3 has not produced a plan for this band.

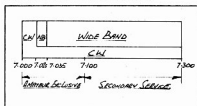


Figure 4. 7MHz

The 7MHz band is shown in Figure 4. Again, the narrow band mode segment is layered between the CW only and CW/wide band assignment at 7.025 to 7.050MHz. This accords with the Region 3 band plan and abuts the Region 1 allocation of 7.035 to 7.045MHz.

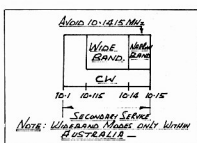


Figure 5. 10MHz

The 10MHz band poses our first dilemma as shown in Figure 5. The Australian authorities permit wide band modes in this narrow amateur allocation and Australian amateurs have seen fit to utilise this privilege, for it is a useful band for interstate contacts, as well as DX. The recommended usage for wide band modes is within Australia only, but the amateur community may wish to establish a Gentleman's Agreement to not use wide band modes (phone) at all. Note that the narrow band overlay completely aligns with the Region 1 RTTY segment. Region 3 has opted to permit narrow band operations across the full band allocation.

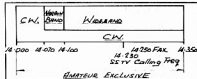


Figure 6. 14MHz

The 14MHz band has traditionally been the international DX band, the band usage plan is shown in Figure 6. Note that the narrow band mode segment sits between the CW only and CW/wide band segments. Its lower end at 14.070MHz accords with the Region 3 band plan and it aligns approximately with the Region 1 lower limit of 14.075MHz. The upper limit extends to 14.100MHz minus the guard band for the beacons on that frequency. The International Beacon Project (IBP) has a world wide series of beacons on the common frequency 14.100MHz and an

appropriate guard band of  $\pm 500\text{Hz}$  in Region 3 is allowed about that point.

Identification is by a time division process, each beacon having its own allocated radiation time interval. Two commonly used calling frequencies for wide band modes (SSTV and FAX) are also indicated on the figure.

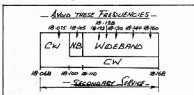


Figure 7. 18MHz

Another of the WARC 79 bands, the 18MHz band is shown in Figure 7. Here the band plan mirrors the Region 3 and Region 1 plans but note should be taken of the number of spot frequencies which Australian amateurs must avoid until this band becomes an exclusive amateur allocation in the, we hope, not too distant future.

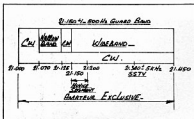


Figure 8. 21MHz

The second international DX band, 21MHz, is shown in Figure 8. Here the narrow band mode segment follows the Region 3 plan and has been overlaid on the CW only segment, (as determined by earlier Gentlemen's Agreements) to achieve co-incidentally a total overlap of the Region 1 allocation, yet avoid intrusion into the quite narrow Australian novice sub-band. Provision is made at 21.150MHz for an IBP time-shared beacon system with an appropriate guard band. This is at the boundary between the CW exclusive and CW/wide band assignments.

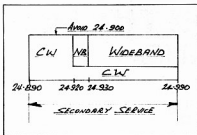


Figure 9. 24MHz

The third WARC 79 band, 24MHz, is shown in Figure 9. Once again the Australian band plan mirrors the Region 3 and Region 1 plans to achieve maximum commonality in such a narrow allocation. A single spot frequency must be avoided by Australian amateurs until this band also becomes an exclusive allocation.

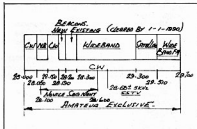


Figure 10. 28MHz

The largest amateur HF band is the 28MHz band, shown in Figure 10. There are a few international implications to planning the use of this band, in particular, the existing beacon sub-band from 28.200 to 28.300MHz and the satellite downlink sub-band from 29.300 to 29.510MHz. Here again the narrow band mode segment aligns with Region 3 and Region 1 and is overlaid on the CW only segment.

The proposed International Beacon Project sub-band from 28.190 to 28.200MHz will contain a primary world-wide time-sharing system on 28.200MHz and a series of secondary continental time-shared systems in the remainder of the sub-

band. Australia should anticipate one primary beacon and up to ten secondary ones. It is proposed to clear the existing 28.200 to 28.300MHz beacon sub-band by 1st January 1990, this will free up band space for Australian novices. Unfortunately, the lower limit of the novice sub-band overlaps the narrow band mode segment (a mode not available to novices for transmitting) but despite these constraints, a clear 400kHz is left for novice CW/phone operation from 28.200 to 28.600MHz, as well as a CW only segment.

As yet no allocations have been planned in Australia for channelised FM repeater operations at the top of the band as there has been little demand for it. Never the less, at the peak of sunset cycles, international contacts occur and an allocation aligned with Regions 2 and 3, namely 29.510 to 29.700MHz may be prudent planning.

Within Australia we are fortunate that DCC has adopted a most co-operative approach and permits a degree of self-regulation, much greater than in many other countries. For example, the US is constrained by legislation to frequency segments for differing modes; furthermore, those allocations vary with licence grade (and they have nearly double the number of grades we have in Australia). With such a large amateur population, the US has therefore materially influenced the development of a Region 2 Band Plan which is significantly different from the requirements of the other two regions. This results in a closer alignment of Regions 1 and 3 Plans as reflected in this paper.

This paper has presented revised Australian amateur HF band plans and the reasons behind that planning, much arising from the recent IARU Region 3 Conference. The plans do differ in detail from the WIA Band Plans, as published annually in the Call Book.

It is now left to you, the amateur, to register your acceptance of these draft plans or to record your dis-satisfaction with any features through the columns of this magazine, through your WIA Division, or Divisional Federal Councillor, or by writing to the WIA Federal Technical Advisory Committee. The last named will co-ordinate comments and present an appropriate recommendation for endorsement by the next Federal Convention. Above all, if you have something to say present it in the right quarters. **do not bad-mouth to all and sundry on air without doing something positive.**

VK1RH revised 30th December 1985 incorporating comments from Allan Foscoff VK3AE.)

AR

# REVERSE REPEATER FOR THE FT-480R

Russell Lemke VK3ZQB  
22 Villiers Street, Port Fairy, Vic. 3284

After reading the article in August 1985 AR by Sam Pascoe VK6KSP on a reverse facility for the Yaesu FT-480R, the writer decided to implement these modifications to his own 480. It concerned him that the operation of the switches under the rig were a little messy and if the same function could be operated from the microphone, it would be much easier and quicker to select.

Sam's lead was taken to see what control voltages were present on the wires around the satellite switch. The purple wire was disconnected from the satellite switch and, after due probing with the meter, it was found that the purple wire went low when the tone button on the microphone, or on the front panel, was depressed and the receiver shifted to the reverse frequency.

The green/white wire went low when the PTT was depressed but transmission was inhibited due to the absence of the purple wire from the switch. To achieve transmit, both purple and green/white wires had to be connected together via the switch so that when the green/white wire went low the purple wire did so as well.

By the insertion of a diode (1N4148) between

the purple wire and the satellite switch the functions were separated. A pull-up resistor to +5V is also required. If the tone button is depressed the transmitter is not activated and the receiver is shifted to the reverse frequency set by the offset switch.

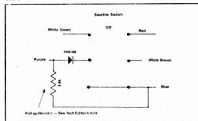
If both PTT and tone are pressed simultaneously the normal function of transmitted tone is operational.

This modification does not interfere with the operation of the switches so that all the design functions of the set are retained.

TECHNICAL EDITORS' NOTE: There appear to be some variations between FT-480Rs. Readers should check for differences. In this case the need for the pull-up resistor may vary between rigs.

AR

Diagram of Modifications to FT480R for Reverse on-Tone Button. NOTE: Remove purple wire and connect via diode as shown above.



# IARU REGION THREE BANDS PLANS

Ron Henderson VK1RH

171 Kingsford Smith Drive, Melba, ACT. 2615

At the recent IARU Region 3 Conference in Auckland, a Working Group was set up to develop Region 3 Band Plans. The report of that Working Group, which was adopted unanimously by the Conference is precisised below.

The Basic Principles underlying the Region 3 Band Plans are:

a In all cases of conflict between a band plan and the national regulations of a country, the latter shall prevail.

b Nothing in these band plans shall be construed as prohibiting different national arrangements, provided that harmful interference is not caused to stations in the countries operating in accordance with the regional band plan.

c Notwithstanding item b above, member societies of Region 3 are strongly urged to use these regional band plans as a basis for their national band plans.

Plans were developed for the bands from 7MHz to 1300 MHz inclusive and are shown in graphical format. In interpreting these band plans, the following notes apply:

a Phone operation includes SSTV, FAX, and modes with similar bandwidths not exceeding 6kHz.

b NB designates narrow band modes including CW, RTTY, Packet Radio and modes with similar bandwidths not exceeding 1kHz.

c WB designates wide band modes including FM.

d Segments marked SATELLITE should be kept clear of other operating modes.

e EME includes other weak-signal propagation modes, ie Meteor Scatter and Auroral Scatter.

f Secondary at 7.100 to 7.300MHz means that amateur stations shall not cause harmful interference to stations of the Broadcasting Service.

g When Packet Radio is used for experiments in which speech liaison is required on the same frequency, the phone segment will be used. However, where the transmission is narrow band only, eg bulletin boards, the NB segments may also be utilised.

h In planning VHF/UHF bands only those activities which were of an international nature, ie intentionally radiated beyond a country's boundaries, were considered as requiring co-ordination within the Region.

Concerning the 1.8 and 3.5MHz bands, the Working Group recommended that the Secretary IARU Region 3 ask all member societies to submit their detailed band plans for these two bands prior to the next conference and that two papers be prepared, detailing current plans for each band. A Working Group could be established at the next conference to consider regional plans for these two bands. These plans will also support future WARC preparations.

The Working Group had no recommendations for bands above 1300MHz.

The Working Group recommended that societies consider the need for a narrow band at 190kHz for experimental purposes.

AR

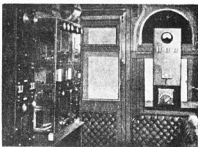
## LOVE FOR TRAINS

Being somewhat of a "fan" of the early history of the then mobile broadcasting station 3YB, it was with interest I read the article in November's AR, page 27.

I unfortunately do not have much in the way of paper information, most of what I have learnt is from a personal approach to those who have had knowledge. I have spent a very enjoyable afternoon with the gentleman mentioned in the article, Mr Harry Fuller. Apart from the information about the radio station on wheels, Mr Fuller was an extremely interesting person himself with his experiences of early radio days.

Pictured are photocopied portions of an information brochure for 3YB. On the reverse side of the brochure is an itinerary for 3YB for 1934.

Contributed by Colin Grace L30060



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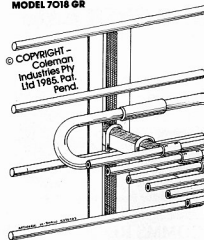
## SPEECH AID DEVICE

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# VHF UHF

## — an expanding world

Eric Jamieson VKSLP  
1 Quinns Road, Forrester, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

### AMATEUR BANDS BEACONS

FREQ	CALL SIGN	LOCATION
50.005	H44HJR	Honlira
50.010	J42IGY	Mie
50.060	KH6EQI	Honolulu
50.075	VX3JAX	Hong Kong
50.109	J01DVA	Japan
51.020	ZL1UHF	Mount Cimie
52.033	P29BPL	Loloto Island
52.100	ZK2SIX	Niue
52.200	VK8VF	Darwin
52.250	ZL2VHM	Manawatu
52.310	ZL3MHF	Hornby
52.325	VK2RHV	Newcastle
52.370	VK7RST	Hobart
52.400	VK8MA	Mawson
52.420	VK2RSY	Sydney
52.425	VK2RQB	Gunnedah
52.440	VK4RTL	Townsville
52.450	VK5VF	Mount Lofy
52.480	VK6RPH	Perth
52.470	VK7RNT	Launceston
52.490	ZL3SIX	Blenheim
52.510	ZL2MHF	Upper Hutt
144.019	VK5RBS	Busselton
144.400	VK4RTT	Mount Mowbaitan
144.410	VK1RCC	Canberra
144.420	VK2RSY	Sydney
144.465	VK5RTW	Albury
144.550	VK5RSE	Mount Gambier
144.565	VK6RPH	Port Hedland
144.880	VK8VF	Darwin
144.800	VK5VF	Mount Lofy
144.950	VK6RPH	Perth
432.057	VK5RBS	Busselton
432.180	VK6RPH	Nedlands
432.410	VK1RBC	Canberra
432.420	VK2RSY	Sydney
432.425	VK3RMB	Ballarat
432.440	VK4RMB	Brisbane
1296.171	VK5RBS	Busselton
1296.410	VK1RBC	Canberra
1296.420	VK2RSY	Sydney
1296.480	VK6RPH	Nedlands
10300.000	VK6RPH	Perth

(1) Advice has been received from John Marshall VK2EGI, the VK2 Beacon Officer, that the latest addition to the NSW Division's Beacon Stations is VK2RSY, one 1296.420MHz and commenced operation on 3rd November 1985. Power output is approximately five watts to an Alford Slot antenna at 30m (100 feet). The antenna is horizontally polarised with a virtually omnidirectional radiation pattern, and is believed to have considerable gain over a dipole. The beacon should provide good coverage of the Sydney area and hopefully will be heard in New Zealand under favourable conditions.

Reception reports are requested and should be sent to: The Beacon Officer, IWA, Box 1066, Parramatta, 2150. All stations which QSL will receive a QSL card from VK2RSY.

Details of VK2RSY are: 28.262MHz 25 watts vertically polarised; 52.420 and 144.420MHz each 25 watts; 432.420MHz 15 watts; and 1296.420MHz five watts. The last four are all horizontally polarised.

Regarding VK2RCH, I have taken a chance and amended the frequency to 144.950MHz, in accordance with the article in September's AR, but no actual advice of the change has arrived here. Power was to be increased to 25 watts, as well.

### THE VHF SCENE

There is a lot to write about this time due to the early closing date for copy for the January issue, thus a number of letters were just too late for inclusion. As a result, some information has become dated, but we will dispose of the letters first and deal with the band update further along. Six METRE STANDINGS for the first time with a very impressive total. He has also sent me some

photographs he took during his visit to the USA in 1983. I plan to use some of these during the next few months, but would like to start with a photograph of Bill Tynan W3XO, who is my counterpart in the US and conducts the QST's WORLD ABOVE 50MHz. Bill and I have been shuffling information backwards and forwards to one another for quite a few years, so from my point of view, it is pleasing to see the other man!



Bill Tynan W3XO.

Graham has also enclosed a picture from his old friend, H44JMBM, who sent several views of his mountain top antenna system, near Hiroshima. Graham comments: "You can see now what it takes to be Number One in the world on six metres! You wouldn't catch me on top of that tower!" VK5LP wouldn't be there either!

Details of the system are: Situated on Mount Noga at 733m, tower 39m high, mast is nine metres long and 11.5mm in diameter, stacking space 6" 7/8", boom diameter 60.5mm, and the antennas are the KLM 50-52-11 with a Ernoto 1105MX rotor. This system has given H44 a total of 76 confirmed countries.

Graham VK8GB, has included a photocopy of his log from 1st January to 21st September 1985 and this brief summary will show just what we don't get in the way of VHF contacts by living in southern ares! 11/185 — 17 contacts to VK6; 16/1 — VK8ZLX; 7/2 — 2 x VK4; 2/3 — JA4MBM; 25/3 — 5 x JA; 3/4 — 37 x JA; plus JA6 and JA4 on 144.100MHz; 4/3 — 2 x JA; 5/4 — 19 x JA; 6/4 — VS8CT; 7/4 — 2 x JA; 8/4 — 3 x JA; 9/4 — 29 x JA on 144.100MHz and included JA4, 6, and 8 districts; also two were worked on 50MHz; 13/4 — 3 x JA; 14/4 — JA4MBM; 28/4 — 36 x JA plus JA45XA on 14/4; 29/4 — VK5ZDR; VK8ZLX; 30/4 — 5 x JA; 13/5 — 13 x JA; 29/5 — JA4MBM; 15/9 — 25 x JA; 16/9 — JA4MBM and 21/9 — JG2CF. Signal reports on 144MHz varied from 5x1 to 5x9, power used was either 20 or 200 watts. Many of the six metre contacts were made with 20 watts.

A letter from Graham, which arrived just too late last month, indicated he had heard a new beacon signing JA6YBR, on 50.020MHz. The call sign indicates it as being a club station on Kyushu Island, but it is not known whether it is an attended keyer, or a beacon, although the frequency tends to support that it is a beacon. (I shall await further information. . . 5LP).

On 7/11, VK8GB had the first Es opening for the summer between 0930 and 1015, working VKs 7FB; 40F; 8ZLX; 8TM; 8GF; and 8KTM, all Alice Springs. In Darwin, VK8WFM and VK8ZRL were also active.

Graham has been monitoring the 10 metre beacons and finds them useful indicators for an impending six metre opening. Thanks for the news Graham.

Two letters have come from Peter VK3DU, the first on 7/11, which indicated the first Es for Melbourne for the summer, the same date

indicated by VK8GB. Stations were worked in Sydney, Newcastle, Walcha in Central NSW, and Bundaberg. Peter runs 10 watts to a three element Yagi, at 10m (35 feet).

A further letter from Peter, on 12/12 shows that on 7/12, he worked P29BH at 2326; 10/12 2230 ZM80Y and ZL1AON; 11/12 0029 FK8EM; 0108 YJ8RG and 0134 FK1TK. This must have been quite a day for Melbourne as Peter said he worked five countries (including VK) in two and a half hours, with the ZL television stations giving an indication of things to come. The Pacific countries stations drifted in and out with changes in propagation, and it appeared only necessary to stay around for a while to work all three that were available.

FK8EM was \$9+ for a short period. FK8EM also said ZM80Y has a lunch break from 2200 to 2230UTC and always calls and listens on 52.050MHz at this time. Peter also said that he had been advised that the P29BPL beacon was on 52.020MHz — I have not heard it so far so I am unable to confirm or deny. . . 5LP. Thanks for the letters Peter, by now you should have worked much more.

A short letter from Eric VK3BXA, indicates his first Es contact for this season was on 9/11 and was VK4FWA at 0150. In Apr. Signals were 5x9, but then the band promptly closed. At 2333, it was Ayr again with a contact to Ron VK4FTJ, but it was again of short duration. This seems a typical pattern during the early stages of the Es summer period. Thanks for writing and you will have had many more contacts by now also Eric.

Ken VK2BNV, sent in his six metre standings and added his station is a FT620B and a 60 watt linear to a four element 12m high antenna. Ken included a photocopy of his QSL from WA4TNW/KL7 which was for a contact on 13th March 1979, and on the back Jay has indicated this was his first VK contact ever on six metres. Steve VK3OT has further stated that this was the first ever VK2 to KL7, six metre contact. Clay reported that the K2 was open for two and a half hours and he had 39 overseas contacts in that time.

A brief telephone message came from Eddy VK4KAA (ex VK4Z2E), who finished up in Mount Isa, after travelling via Melbourne and Ipswich! Monitoring OSCAR-10, six and two metres. During an inversion over the Coral Sea before leaving, he had had a good two metre contact to Port Moresby, via the repeater, using his hand-held. Also, AUTOTR PTY to Cairns on two metres, all helped by the VK5 designed pre-amplifier.

While still on the letters bank-up, one has come from Toshio JRBXPV, thanking me for confirming his contact with VK0AQ, at Mawson. His home town of Honbetsu is only small he says, 13,000 people, placed among low mountains and not really good for VHF. However, he has worked 55 DXCC countries via AO-10, but still needs South America. He operates all bands from 3.5 to 432MHz using phone and RTTY. He does have some problems with the beam antennas due to ice — most winter temperatures are around -10 degrees, with the lowest last year -40 degrees, so that is cold.

David VK2BA, sends his amended list of six metre countries and adds that Chris ZM80Y made good use of a tremendous opening on 10/12 to work into VK2, 3, 4 and VK8GB. David said he was hardly brave enough to take his beam off Kermadec until he had worked him! (Maybe VK5LP was lucky, but ZM80Y called me saying I was his first VK5 and he was looking for a contact!) On 7/12, P29BH caused a local pile-up when he came through at around 2250. YJ8RG and the FKs have added to the interest of those early openings.

David is pleased to report that in Sydney, at least, most operators seem to be observing the importance of leaving the 52.050MHz call frequency relatively clear of QSOs, although there



more than 40 watts and plenty of times 10 watts is adequate.

Whatever else needs to be said about the VHF bands can now be left until next month, when I should have some reports coming in from my correspondents in other states, together with what transpires at this end from 23/12 until next copy deadline which is 21st January 1988. This should fit in nicely with the best of this summer's Es. I anticipate some tremendous openings starting on 26/12 and going through until New Year — next months report will indicate if they eventuated.

## THE ROSS HULL CONTEST

Despite the huge volume of contacts, there seems little enthusiasm for giving out numbers for the Ross Hull Memorial Contest! I personally have found that from time to time I have almost had to drag numbers from people instead of the usual spontaneity.

I thought this might be so with the drastic changes to the scoring table, but if nothing else it has made operators come out and say what they think and thus a view of feelings can be ascertained. As I said prior to the start of the Contest, that having the hindsight of this year's Contest, we should start looking at what is necessary to preserve the Contest as soon as 1988 starts, instead of leaving it until almost the time for the next Contest. I have some thoughts on the matter and will air them perhaps next month, but I want to hear from others prepared to be constructive with their thoughts, and having regard for the needs of all operators, both multi-band and those using one or two bands. If you don't think the present scoring table is right, then send me what you believe is right and setting out examples in columns, or by some means, to indicate properly what you are saying. I need the information quickly please — by the time you read this it will be February and March copy will already be in the Editor's hands, so the earliest anything can be printed for readers is April, and that is four months into the year.

## EME REPORT

Doug VK3UM used the call sign VK75A for his random contacts on 2/11 and 3/11. Conditions were poor to the US and fair to Europe, the position being reversed on 3/11. Contacts made on 2/11 were: 1415UTC K1FO sent 549, received 439; 1911 DL9KR 349/449; 2001 DJ6MB 439/449; 2025 DF3RU 549/549; 2033 F9FT 4x3/4x3; 2102 OH2TI 0/0 — this was a new country so Doug also worked him as VK3UM; 2132 F1FHI 0/0.

3/11: 1500 WA1RWU 4x4/4x3 (also as VK3UM); 1540 K2JOK 4x4/3x3 (also VK3UM); 1645 VE4MA 0/439; 1800 W7GBI 449/439; 2035 SM3AKW 439/449; 2054 DL9KR 5x5/5x5; 2115 HB9SV 0/0.

As an indicator of the poor conditions, HB9SV is one of the best stations, using 16 bays of DL6WU antennas, wooden booms and open wire feeds.

On 23/11, again using VK75A: 0825 JA9BOH 0/0; 0910 JA4ELC 339/339; 1342 K85GB 439/439 (also as VK3UM); 1405 JA6CZD 449/449; 1459 DF3RU 449/0; 1543 G3LTF 339/339; 1557 F9FT 439/439; 1607 F1FHI 0/0; 1630 ISMSH 439/439. 24/11: 0657 K2UYH 4x3/4x4; 1325 OH2DG 339/339; 1505 DJ9BV 0/0 (also VK3UM); 1530 HB9SV 439/0; 1548 G4EZN 349/0 — five minutes later reports were exchanged 559/449 (also VK3UM); 1608 DJ6MB 449/449; 1615 to 1637 Doug reported "all hell was let loose" with up to three stations calling at once, so started working break-in! 1637: conditions were going down again, G3LQR 339/339; 1657 F9FT 439/439.

## 50-54MHz DX STANDINGS

DXCC Countries based on information received up to 15th December 1985. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50MHz was not authorised.

Column 1: Six metre two-way confirmed					
Column 2: Six metre two-way worked					
Column 3: Crossband (6 to 10) confirmed					
Column 4: Crossband (6 to 10) worked					
Column 5: Countries heard on 50MHz					
Column 6: Countries heard on 52MHz					
Call Sign	1	2	3	4	5
VK9GB	39				
VK2BA	28				
VK2DDG	25	26	2	12	3
VK3OT	25	25		10	
VK4ZJB	23	24			4
VK2QF	23	23			
VK2VC	22	22			
VK2BN	20	21			
VK3XQ	19	20		1	
VK5LP	18	20		6	3
VK3AMK	17	17			
VK4TL	17	17			
VK4ALM	17	17			
VK3NM	16	17			
VK7JG	16	17		2	
VK3AJI	16	17			
VK4ZSH	15	16			
VK4ZAL	14	14			
VK6GX	10	10	1	1	
VK3ZZX	10	10			

VK6RO

9 9 3 3 2 3

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number of confirmed contacts.

The next list is due to appear in August 1986, and entries will need to be on my desk no later than 15th July 1986. Claimants are reminded that full details of all contacts are required, viz date of contact; time in UTC; call sign of station worked; country; mode; report sent; report received; QSL sent and whether received.

Split frequency contacts should be indicated. Please add YOUR call sign and signature, plus the date of your claim.

Most of the submissions sent to me so far have been very neat and precise and are a great help in determining eligibility. Computer print-outs of claims and updates are quite acceptable. I still reserve the right to require any claimant to send me any QSL cards needed to verify a particular contact.

There are still a lot of operators around the country with good tallies who are not listed. A few who come readily to mind include VKs 1VR 2BHO, 2KAY, 3AOS, 3AUU, 4ZAZ, 4JH, 4RO, 5RO, 5ZDR, 5XK, 6HK, 6KZ, 7ZIF, 7KJ, and 8GF. There are many others of course, but the inclusion of most of the above would make it a rather interesting list. Once the original list is made, updating is easy.

## CLOSURE

There is still quite a lot of material suitable for these columns on my desk, but this will have to be carried over until next month — I cannot extend the Editor's friendship too far by continuing to use up space.

Please remember the Ross Hull Contest entries must arrive at the Contest Manager's desk by Friday, 7th February 1986. If you entered, please send in a log and add any constructive comments.

This year, South Australia celebrates its 150th Anniversary and it will be a very busy time for many people, including your scribe. I hope I can stand the strain!

Closing with the thought for the month: "A man profits more by the sight of an idiot than by the orations of the learned". 73, The Voice in the Hills.

AR

# Ross Hull Contest Logs must be on the FCMS Desk by 7th February 1986

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# Awards

Ken Hail VK5AKH  
FEDERAL AWARDS MANAGER  
St George's Rectory, Alberton, SA. 5014

This is the first time I have written this, or indeed any other column. I bring to it little of expertise and long experience of my predecessors, though I hope to be able, from time to time, to call on one of them for advice. My comparatively brief amateur activity has fallen into well-separated periods — as a SWL in England in 1946-56, and as VK5AKH from 1961.

I hope to continue the work of Bill Hemphill in getting the DXCC records into a standard form. An up-to-date DXCC ladder will be produced as soon as possible, but I make no promise as to how soon. DXCC updating, and the ladder, will be the first priority.

The opinion has been expressed that we should forget all about deleted countries. There are things to be said on both sides. An so, in the interest of those who will never be able to work the deleted countries, the order on the ladder will be determined solely by current countries; but in the interest of those who have worked them, the score including deleted countries will appear alongside, and determine the order of those who are on the same rung.

## UPDATED LISTING

The following awards have been issued since the last list was published.

## WORKED ALL VK CALL AREAS

1332	JA1BIN	Takashi Yamamoto
1333	JA4NHG	Masashi Shimokita
1334	JA2BAY	Hideki Takeuchi
1335	JH8ABO	Hidekatsu Hizume
1336	JM1VVRW	Toshi Takahashi
1337	JA2TAS	Yoji Masuda
1338	OK1YKX	Bohuslav Petr
1339	OK2PEX	Antonin Pokorny
1400	YV1DPS	Rafael Gutierrez
1401	G3CZC	E L Devereux
1402	G4RZD	Keith Russell
1403	TG4JAS	T G Mein-Bellie
1404	524EG	Tony Higby
1405	JABCLN	Hideaki Sato
1406	HL2SF	Wonki Oh
1407	JF8BYA	Satoshi Irie
1408	VK2CKW	Ken Watson
1409	OK2BGR	Slavomir Nouak
1410	G4CJY	Brian Payne
1411	VK4AIX	Joe Ackerman
1412	DL1BS	Kuno Huber
1413	DJ3AS	Harald Doelle
1414	G3QZS	Harold Rudge
1415	JR1BMU	Akihiro Aoki
1416	JA0TME	Hidekazu Okada
1417	JA5JTE	Hiroyuki Kurobuchi
1418	JH1QYT	Akira Numazaki
1419	JH1BSSE	Masao Yamamura
1420	JA7LMZ	Fumihiko Konno

This column will, I hope, contain reviews of awards which are both easy and difficult, those with no charge and those which are expensive. If there is any preference, it will be for awards issued in this country. To maintain this variety, club secretaries are asked to send details of their awards, and anyone at all invited to request publicity for his favourite award or specialty.

How many, I wonder have obtained the UN-DU Award, which Bill Verrill featured in this column in February 1982? It looks very colourful, and impressive on the wall of his shack. Please write to me if you have got it, and I will compile a list of holders of this award, for this column in the June magazine. If this idea proves popular, we could do the same thing with other prestigious awards.

## THE LAND OF THE BEARDIES AWARD

Finally, here is a new one, which is from the Glen Innes and District Amateur Radio Club. A letter from the club relates that the major credit for opening up the area of the Northern Tablelands, that includes Glen Innes, goes to two stockmen, Chandler and Duval, who worked cattle in the Armidale area in the 1830s. They both wore long flowing beards, and anyone looking for good land was told to look for the 'two beardies'. Hence the area soon became known as "The Land of the Beardies".

This explains the title — THE LAND OF THE

BEARDIES AWARD, which was launched at the Annual LotB Bush Festival, in November 1985.

Qualifications for the award are: 10 points which are accumulated by working club members and the club station. Point values are:

The Club Station, VK2DOQ is worth two points.

Bearded members are worth two points. These are — VK2s BGO; BYV; EBU; ESL; and VRB.

Other club members are worth one point. These are — VK2s KDB; TB; BIO; PLN; BSF; PVD; WP; ELJ; PXT; KDA; EEX; ERG; SEC; EJC; ATG; and KJV.

One contact, per member per band, can be counted. Repeater contacts do not count. The cost of the award is \$2 surface mail — air mail is extra.

Bearded claimants may have their awards suitably endorsed by sending a photograph. Claim is by certified log extract, verified by one other licensed amateur and should be sent to the Award Manager, PO Box 26, Glen Innes, NSW. 2370.

## ARRL INTERNATIONAL HUMANITARIAN AWARD

The ARRL Board of Directors have established this award to recognise those licensed radio amateurs (or groups of radio amateurs) worldwide, who by use of their skills in amateur radio have provided extraordinary service for the benefit of others in times of crisis or disaster.

The Award will consist of a plaque or medalion to be presented to the recipient and an article describing the recipient's extraordinary achievements will appear in QST magazine, IARU societies' publications and general-interest consumer magazines.

Licensed radio amateurs or groups of amateurs from any country worldwide are eligible for this award, and nominations for it will be accepted from any licensed radio amateur or governmental organisation that has received the benefits of a radio amateur's extraordinary service. Nominations must contain

... a summary of the actions of the nominee that qualify him/her for the award; and

... statements from at least two references including names and addresses (and telephone numbers where possible) for verification.

All nominations must be sent to: ARRL International Humanitarian Award, American Radio Relay League, 225 Main Street, Newington, CT 06111, USA.

In the event that no nominations are received, the ARRL International Humanitarian Award

Committee may itself determine possible recipients. The Committee reserves the right to make no award in a given year.

Nominations and supporting material for the 1985 Award must arrive at the ARRL Headquarters prior to 1st May 1986 and the recipient will be announced in July 1986.

Nominations for the 1986 Award and subsequent awards will close on the last day of the year, 31st December.

All radio amateurs are also invited to submit designs for the plaque or medalion that will symbolise the ARRL International Humanitarian Award.

Designs will be judged on aesthetics and how well they symbolically represent both international understanding and goodwill, and assisting people in need through amateur radio. Each design must include the ARRL diamond logo and the "ARRL International Humanitarian Award" title; each must be submitted on a separate piece of 8½ x 11-inch white paper. The name, address and call sign of the artist must not appear on the front of the paper but must appear on the back of each entry. Artists may submit as many entries as they wish. The recommended dimensions and other production specifications must be clearly stated for each submission.

The artist whose design is chosen will be awarded an engraved plaque, a clothbound 1986 ARRL Handbook and photo coverage in QST magazine.

Entries should be addressed to "Humanitarian Award Design Contest", postal address as above, and must arrive no later than 18th June 1986. All entries become the property of ARRL and cannot be returned.

## VK5 JUBILEE 150 NETS

South Australian radio amateurs will be active in 1986 for the celebration of the State's 150th Jubilee year.

Nets will be in operation to promote the Jubilee 150 to DX and interstate stations and facilitate exchange of points for the Jubilee 150 Award.

Full details of the Award were published in AR October, page 47.

PHONE NETS (all times UTC, frequencies MHz):


Primary net —

Sundays, Tuesdays, Fridays, on 3.586 at 1000.

Other nets —

Monday, on 7.086 at 0100; 14.186 at 0200; 28.470 at 0900.

Tuesday, on 14.186 at 1000; 21.186 at 0400; 21.286 at 0600; 14.286 at 1100.



## "LAND OF THE BEARDIES AWARD"

Presented to       SAMPLE       for the required

number of two-way contacts with club members.

Award No.                      Date:                     

Awards Manager:

Wednesday, 21.186 at 1000; 28.470 at 2230.  
Thursday, 7.086 at 0300; 14.186 at 0300.  
Friday, 14.286 at 1100.

The Primary Net on 3.586MHz will remain throughout 1986. However, other bands and time will change according to conditions. These changes will be published one month prior to coming into operation.

#### CW NETS

Primary net —

Monday, Thursday on 3.536 at 1000.

Other nets —

Tuesday, 7.036 at 0100; 21.136 at 0900.

Wednesday, 14.036 at 0300; 3.536 at 1000.

Thursday, 7.036 at 0300; 21.136 at 0500.

Friday, 14.036 at 0900; 28.186 at 0300.

DX operators are requested to operate on, or near the above frequencies at other times as these frequencies will be widely published via Nets and Clubs, etc.

VK5 stations will check in during the 10 minutes prior to the nominated starting time to allow easy listening of other stations wishing to contact VK5s.

AR

## PRINTED CIRCUIT BOARDS

(VHF COMMS MAGAZINE)

Eycke Zimmermann ZL1AGQ, is the local (ZL) facility for the manufacture of printed circuit boards for the VHF COMMS Magazine. Eycke holds the negatives, and he can be contacted at:

PO Box 31-261,  
Auckland 9  
New Zealand

# Amateur Radio

## MAGAZINE AWARDS



Marlene VK5QO



Ron VK3AFW



Lloyd VK5BR

At the December Publications Meeting, the Annual Amateur Radio Awards for 1985 were selected. The Award recipients are:

Marlene Austin VK5QO, was awarded the Alan Shawsmith Journalistic Award for her article on the history of the VK5 Division.

Ron Cook VK3AFW received the Higginbotham Award for his services and articles to Amateur Radio.

Lloyd Butler VK5BR, was awarded the Technical Award for his various articles contributed to Amateur Radio during 1985.

The Committee considered that the Initial Aircraft Enhancement article, written by Doug McArthur VK3UM, was worthy of an Honourable Mention.

# RADIO EXPERIMENTER'S HANDBOOK



This first volume is 132 pages chock-full of circuits, projects to build, antennas to erect, hints and tips. It covers the field from DX listening to building radio-teletype gear, from 'twilight zone' DX to VHF power amplifiers, from building a radio FAX picture decoder to designing loaded and trap dipoles. This book carries a wealth of practical, down-to-earth information useful to anyone

interested in the art and science of radio. Your copy is available by mail order for \$7.95 plus \$1 to cover postage and handling (add \$5 to these charges for air mail postage outside Australia) from:

Federal Marketing  
P.O. Box 227  
Waterloo, N.S.W. 2017

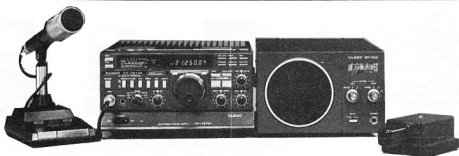
AN86



# BAIL ELECTRONICS

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### HF TRANSCEIVERS

FT980-all mode; 12 memories; general coverage receiver  
FT757GX-all mode; 8 memories; all normal options installed; general coverage receiver

### VHF & UHF TRANSCEIVERS

FT726R-all mode; 10 memories; 10 watts output; two VFOs; can hold three modules (2m, 6m, 70cm, 21/28m modules) plus satellite IF unit; AC/DC operation

FT203R-handheld 2 metres; 2.5 watts, thumbwheel; optional headset/microphone & VOX operation  
FT209-RH-handheld 2 metres; 5 watts; keypad entry; optional headset/microphone & VOX  
FT290R-all mode portable 2 metres; 2.5 watts  
FT270R-mobile 2 metre FM; 25 watts; 10 memories; optional voice synthesiser  
FT2700R-mobile 2 metre & 70cm; 25 watts both bands; 10 memories; full duplex 2m/70cm

FT703R-70cm handheld; thumbwheel 2.5 watts  
FT709R-handheld 70cm; keypad entry; 45 watts

### LINEAR AMPLIFIERS

FL2100Z-160 — 10 metres; 1200 watts maximum input  
FL2010-2 metres; 10 watts out; suits FT208, FT290, etc.  
FL7010-70cm; 10 watts out; suits FT708, FT790, etc.

### ANTENNA TUNING UNITS

FC700-suits FT707/77; inbuilt 150 watts dummy load  
FC757AT-automatic; suits FT757/FT980; inbuilt 150 watts dummy load  
FAS-1-4R antenna selector (four-way)

### EXTERNAL VFO

FV700DM-suits FT77/707; 12 memories  
FV102DM-for FT102

### TRANSVERTER

FTV707-suits FT707/77, takes one module  
-6m, 2m, 70cm modules for FTV901, FTV107 & FTV700

### POWER SUPPLIES

FP700-suits FT77, FT757; 20 amp inbuilt speaker  
FP575GX-switch mode; 20 amps

FP757HD-heavy duty; inbuilt speaker fan  
FP7-3 amps  
FNB-2, FNB3, FNB4-NiCad packs for handhelds

### CHARGERS AND DC/DC ADAPTERS

NC-15; NC-8; NC-3A; PA-2; PA-3; etc.

### EXTERNAL SPEAKERS

SP102-suits FT102, FT726, FT757GX; has filters  
SP980-suits FT980; has filters  
SP55-general purpose

### TRANSCEIVER ACCESSORIES

AM/FM units; keyer units; WARC bands mod kit for FT101Z, FT107, FT901; FIF-232C (RS232 interface); extender boards; mobile brackets; etc

### MICROPHONES

MD-1B8-deluxe desk type with scanning  
MH-1B8-hand mic with scanning  
MH-12A2B-speaker/mic for FT203, 209, 703, 709  
MF-A3B-boom mic for mobile or base use  
YM-34-desk mic; dual impedance  
YE-7A-hand mic; 4 pin; 600 ohm

*We also have a range of YAESU COMMERCIAL HANDHELDS and MOBILES approved by DOC. Low and High band VHF, VHF Marine handhelds, UHF handhelds and mobiles.*

**TELEPHONE, TELEX OR WRITE TO BAIL ELECTRONICS FOR HELPFUL ADVICE.  
MAIL ORDERS ARE WELCOME.**

YD-846 — hand microphone; 50 kohm.  
 YM-36 — hand microphone; noise cancelling.  
 YM-40 — for FT-480, 680, 780.  
 YM-47 — for FT-290, 690, 790, 230, 730.  
 YM-49 — speaker/mic for FT-290, 690, 790.  
 YM-24A — speaker/mic for hand-helds; four pin, six pin, seven and eight pin- plus and sockets for above.  
 YH-1 — head-set/boom microphone for hand-helds and mobiles.  
 YH-2 — head-set/boom microphone for FT-203, 209, 703, 709, SB-1, SB-2, SB-3, SB-10 switches.

## HEADPHONES

YH-55 — with ear-muffs.  
 YH-77 — lightweight.

## RECEIVERS

FRG-8800 — HF communications receiver, all mode.  
 FRV-8800 — VHF converter (118-174MHz) for FRG-8800.  
 FRG-9600 — VHF/UHF receiver; all mode; 60-905MHz; 100 memories.  
 FR77700 — antenna tuner for FRG7700/8800.  
 FRA-7700 — active antenna for FRG7700/8800.  
 FRV7700 — VHF converters for FRG-7700.  
 Memory unit option for FRG-7700.

## HAM CLOCK

Yaesu QTR-24D — quartz, shows time zones.

## FILTERS

CW, CW (narrow), AM, SSB (narrow), for transceivers.  
 FF-501DX (30MHz LP).

## SERVICE MANUALS

For transceivers and receivers.

## VACUUM TUBES

6JS6C (NEC); 6146B; 6KD6; 6JM6; 6GK6; 12BY7-A.

## SEMI-CONDUCTORS & SPARE PARTS

We have a large range of Yaesu spares; if they are not in stock, we will get them from Yaesu.

## EMOTATORS ROTATORS

502SAX; 1102MXX; 1102MSAX; 1103MXX; 1103MSAX.  
 Rotator accessories — 301 bearings; bottom clamps; couplings; six and seven core control cable.

## MORSE KEYS

Hand keys; "Bug" keys; manipulators; Katsumi electronic keyers.

## METERS

SWR-200 Oscarblock power/SWR dual meter — up to 150MHz.  
 T-435M fwd/ref power dual meter — 146 and 435MHz 'N' connectors.  
 FSL-5 — SWR dual meters; ideal for low power transceivers.  
 YS-60 — SWR & Power; 1.6-60MHz.

## ANTENNAS

Hidaka VS-33 tri-band beam; VS-73SR UHF 7.8dB mobile; VS-73GH 70cm ground plane; VS-27GR 144/435MHz mobile.  
 Yaesu RSL series for HF mobiles; RSL145 2m five-eighth wave mobile; RSL145 2m ground plane; RSL435 70cm colinear; spare antennas for FT-290/690; YHA-44D half-wave antenna for 70cm hand-helds.  
 DPCP5 — trapped vertical 80-10m; trap radials included.

## COAXIAL CABLE

5D-FB; 8D-FB; RG58U.



**FT-757GX HF ALL  
MODE  
TRANSCIVER**

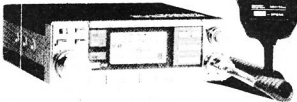


**FRG-8800  
COMMUNICATIONS  
RECEIVER**



**FRG-9600 VHF/UHF  
COMMUNICATIONS  
RECEIVER** 60-905MHz;  
AM; SSB; FM; FM(W) Modes;  
100 Memories; Selectable  
Scanning Steps.

**FT-2700RH 2m/70cm  
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 and Staff —  
 VK3BSR



# How's DX?

Ken McLachlan VK3AH  
Box 39, Mooroolbark, Vic. 3138

Ladies and gentlemen — is it not time we thought a little to the future? Where if any, are our new exponents of the hobby being sought? I admit that we are at, or close to, the bottom of the Solar Cycle and the bands are pretty quiet but they will be as quiet when conditions improve. Many have lost interest, sold their equipment and gained an interest in another hobby, even though there are plenty of countries still to be heard.

Will they return? If they don't who will fill the void? DX operators are a 'breed' alone and we must introduce the teenagers now to this remarkable hobby that we have the privilege of being. How many have been interested in introducing it into the schools, JOTA and Youth Organisations? I feel that it can be answered with saying a very small percentage of our licensees, unfortunately. As has been said in this and other columns of this magazine, if we do not use them, we will lose them. The intruders are moving in and if the DXer does not expand his or her activities, they will stay.

Interest your local school, and council (who generally control youth activities in their area) now of the benefits of our hobby and please do not use the excuse that the bands will be overcrowded at the peak of the next solar maxima, as that excuse does not gell in my book, the more the merrier is the unselfish approach and let us do something about it now — before it is too late. Now is the time to recruit more members to our fraternity, whether it be on CW or SSB. Who cares, it is a hobby that is only as expensive as you want to make it.

Later this year, a technical article will be reproduced in Amateur Radio showing how to build a solid state transmitter with readily obtainable parts at a moderate cost to the individual. This is the basis for the beginner to start with and develop his or her confidence. What do you, the reader think? Let your division know your ideas now, so they can be discussed and a plan of action can be drawn up at the next Federal Convention.

## MORE KW FOR HV

The new Ambassador to HV-land is William Albert Wilson KB6ARO/IOWW, a gentleman with a very interesting history. William was born in Los Angeles on 2nd November 1941, and during his early career worked as an Oil Well Manager, then became a land developer and Southern California rancher. This talented man for many years was a trustee of the now President, Mr Ronald Reagan's personal finances until he was appointed the Presidents Envoy to the Holy See in 1981.

William on 10th January 1984, was elevated to the appointment of the American Ambassador to the Vatican, one of 106 ambassadors from different countries. He, with his wife, lives in a villa leased from the American University in Rome, which is located in the Seven Hills area.

William reports that the Vatican has increased power in their installations of the stations with the calls HV1SJ, HV1CN and HV2VO. It is interesting to note that HV1SJ is outside the confines of Vatican City yet it is classed as a country for HV accreditation.

HV1CN located in the Vatican City, now sports a new set of equipment, donated by the Knights of Columbus. The equipment consists of a 930S driving a Henry 3k Linear and a five element KLM beam. Not bad if propagation is in the right, if any directly.

HV2SJ, generally referred to as 'Strawberry Jam', is running modern equipment and is under the control of 'Pino', alias Dr Giuseppe d'Aurelio IODID and Father Lars Roth, a Jesuit Priest.

At the Vatican Observatory, the station HV2VO is operated by Father Edmundo, also a Jesuit priest whose station boasts a 930S and a Henry 2k Linear. It is operated by the Bel Air Radio Association, in Southern California.

## NEW COUNTRY CRITERIA

The ARRL News Release, 6th December 1985, advises that the ARRL Awards Committee, acting on the recommendation of the DX Advisory Committee, has unanimously accepted a

modification of the wording of Countries List Criteria 5(b). It now reads as follows:

5(b). The following will not be eligible for consideration as a separate entity from the host country: Embassies, consulates and extra-territorial legal entities of all nature, including but not limited to, monuments, offices of the United Nations agencies or related organisations, other inter-governmental organisations or diplomatic missions.

So folks, my personal opinion is that it says goodbye to 4U1VC and maybe TP21, but really, who knows? The scene could change later this year, so keep those precious cards, just in case!

## LEFT FOR PASTURES GREEN? ?

Mike A71AD, who has also operated as A7XD, for the past six years with about 52 000 QSOs under his belt, has left the State of Qatar. Unfortunately Mike had to leave the logs with the authorities and there is no chance of receiving a card if you missed out, though Mike was very thorough with his QSLing and I am sure most people would have one via the Bureau.

## AZORES — A NEW PREFIX

Effective this year, the CT2 prefix, according to LES NOUVELLES DX, will be replaced by a CU plus number which will denote the licensee's island of residence.

The number system will be as follows: CU1 Santa Maria, CU2 Sao Miguel, CU3 Terceira, CU4 Graciosa, CU5 Sao Jorge, CU6 Pico, CU7 Faial, CU8 Flores and CU9 Corvo. Another prefix hunters delight!

## A NEW DXCC COUNTRY? ?

Eventually and probably yes. I can really hear the 'mutterings' of DXers far and wide of 'not another one' as I write this! Aruba, in the Netherlands Antilles will be granted separate status this year. As from the 1st January, they issued their own stamps and will exclusively use the P4 prefix. It is anticipated that it will be a decade before full independence is granted, so rest easy folks — it may be a long way off yet and there will be many more 'new' ones to chase first.

## LIFE NOT SO EASY

Larry N7DF initially during the first weeks of his stay in Chad had to use the call N7DF/TT8, which was good for the issuance of the permit on 12th July 1985, until 11th of October last year. Larry was using a 1/4 wave 20 metre vertical attached to the balcony rail of his unit. Propagation was not good and he worked mainly Europeans and a few JAs, lots of really rare African prefixes and less than what one could count on their fingers back into his home country. Most of the operation was on CW.

Larry's problems were compounded by a six day working week of between 12 to 14 hours per day. The Ministry of Information together with the Ministry for Security, who issued his amateur permit also allowed Larry the 17th permit to take photographs. Even then he was arrested twice and of course freed on presentation of his authority after it was verified. For company he had a machine gun bunker about 15 metres away from his QTH window. Let us not complain folks, at some of our misfortunes and it can be imagined there were no complaints about loud noises emanating from his radio, I am sure!

## NEW FORMAT

World Radio has changed its format to approximately the same size as Amateur Radio. In a friendly Christmas note to the Managing Editor, Christine Wilson KA6TAL, who readers gained a profile in the December issue of this column last year, the remark was made that it was a lot easier to read whilst having breakfast, as I pick my mail up each morning before 8am. All the contents have been retained and a couple added, including a new Editor, Lou Ann Mercer K6BHF. This excellent publication, is in my opinion value for money. Good luck in the new position Lou Ann! World Radio, like our own publication, is

dependent on the amateurs and readers contributions, whether it be technical or social. Have you contributed to AMATEUR RADIO lately?

## TROMELIN ISLAND

Roland FR7AI, hopes to activate this wanted one this month. Watch out for the 'pile ups' if the band is open and that is the big question.

## PERSISTENCE

Mike VK6HD, a keen exponent of the 160 metre band, notched up his 1000th European contact on this wavelength in October. Congratulations Mike and you must have seen many beautiful sunrises. Whilst on the low bands, one well known personality on 160m is Peter ZL9AA, who is an avid 160 metre enthusiast.



Peter ZL9AA, operating the 720A on battery power into an inverted 'Vee' antenna, from Campbell Island.

## YIHBGD

This station at the present has no QSL cards of their own to issue, therefore it is estimated that there are some 2000 stacked in a cardboard box awaiting reply. The Japanese DX Family Foundation has had printed and sent to Baghdad, some very colourful cards depicting the operating position, antennas and the city Mosque.

The few operators that have individual Post Office boxes are responsible for their own cards and it is unknown if they can oblige due to economics. Yasu JR1AIB, gained all this information when he visited Majid, the Chief Station Officer. Yasu was allowed to make 20 odd QSOs on 20 metre CW, amongst whom were the JAs who received a new DX Country, to add to their totals.

Majid advises that it is best to send cards air mail, due to the hostilities by sending 'sea mail' through the Straits of Hormuz, where they could end up in the desert. He also advises that IRCs are valueless in that country if the issuing date is in excess of two years and three IRCs are required.

Yasu reports that the station is well equipped with Drake 'C' Line and an Atlas transceiver, a Tribander and inverted 'Vees' for the lower bands.

The correct mailing address for YIHBGD is PO Box 5864, Baghdad where you may have a chance of picking up that much sought after card. Good luck!



Yasu JRI1AIB pictured whilst at the station.

## TAIWAN

Tim BV2A/B, is still the number one amateur in this country and has moved to a new 'shack', so it is anticipated that he will become quite active again.



Tim BV2A in his new operating position.

Feng BV2DA, has worked 4000 odd stations since obtaining his licence and his son has just returned laden with more equipment such as a tri-band beam, rotator and CW filter from JA. Hence a bigger signal and more time on the bands, much to Feng's wife's dismay as her complaint now is that he forgets about meals and going to church on Sunday. My advice to her is that things will get worse before they get better and it may be a case of joining the growing group of amateurs in that country and allow Feng to cook the meals.

## BEWARE — ANOTHER PIRATE

Two reports of a pirate named Jason. This person is using the calls of BV0BA, CH, JC, JR, RL, CBA and BV9CR. It appears he is working lots of JA, VK, W and ZL amateurs.

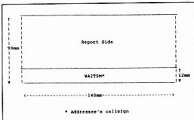
At the time of writing the only authorised call signs issued are BVs ZA, B, DA, FA (one of the amateurs who supplied the information), GA, SHA, 6IA, 7JA, LA, ZA and the special station BV0CRA, which is not presently in use. The legitimate users of the frequencies in Taiwan are very upset about the embarrassment this 'person' is causing them. Let us as DXers assist them, by ignoring the 'pirate calls'.

## QSL CARDS

I started something when I commenced mentioning QSL cards. Ash VK3CIT/ZL4HM has written to express his concern about computer generated cards and recalls reading somewhere of a complaint by a bureau that they did not have enough stiffness in them and QSLs printed on computer paper were not convenient to handle.

Practical Wireless quoted a Region 1 decision that was apparently approved by the other two Regions. The specifications are as follows: Dimensions 140mm x 90mm and a paper weight of between 190-250gsm. The report side of the card must have a 12mm high strip at the bottom and must contain only the recipient's call. This will assist future optical scanning of cards for rapid processing. Computer generated cards on plain paper are not acceptable.

According to the QSL Card Working Groups Report at the Sixth Regional Conference held in Auckland last November, it was recommended that an interim specification similar to the above be adopted for societies to base their own specifications and the JARL be asked to continue liaison with societies in other Regions with



The card as Ash recorded it in his computer. reference to automatic handling and machine sorting techniques.

I must clarify my own computer generation of cards. The information (sorted alphabetically by call sign) is printed onto a standard adhesive label which is attached to the card. No sorting is then required.

## MINAMI TORISHIMA

This small triangular island, with each side measuring about two kilometres, has a 1500 metre runway and a 400 metre LORAN tower, and a population of only a handful of inhabitants who are employed by the Department of Meteorology and the Defence Department. Special permits, not easily obtainable are required to visit the area.

Masa JH5EES, visits the island about once a month and of course operates his equipment as time permits, which is capable for all bands on both CW and SSB. If you want this island, drop Masa a line with an SAE plus two IRCs and set up a sched. He is very obliging and I am sure it will bring results.

## THE 'GLOBETROTTLING COLVINS'

Heather VK2HD, has kindly passed a letter on from Lloyd and Iris Colvin via the YASME Foundation. Iris and Lloyd note that they made approximately 10 000 QSOs from Namibia in South West Africa to amateurs in 146 countries. They note that they were one of the first to use the ZS3/home call and Iris's call was in use this time. There was much confusion by the amateurs calling ZS3/WQL, with calls being heard such as W6QL/ZS3, ZS3/W6, ZS3, W6QL, ZS3QL and on it went.

If you worked such strange calls, you were not the only one and please check your log and submit the correct call when applying for your card to PO Box 2025, Castro Valley, California 94546 USA.

They both hoped to be operating from the Kingdom of Lesotho prior to Christmas last year.

## THE COLVIN CERTIFICATE

In the November issue, I expressed an opinion about a 'Colvin Certificate'. In fact one does exist. Reg VK3YD, has provided proof of that by supplying Certificate No 344.

Perhaps the Yasmee Foundation would like to supply details and they will be promulgated in this column to the folk that have worked the family over the years and been unaware of its existence. Reg's certificate for CW operation is by no means the first and that was issued on 1st June 1969.

## BEWARE!

Some person is pirating the call 9M2PV and quoting VK2KF as the QSL Manager. This is not a genuine operation and any clues as to who the culprit could be would be appreciated by the Malaysian authorities and VK2KF.

## ANOTHER OTH RADAR SYSTEM

It appears that the JA defence forces will be setting up a system during this year. It is proposed to mount the 200kW transmitter on two island, which will take up an area of 375 metres by 375 metres. The receiving site is anticipated to be on Chichijima Island, which is the main island of the Ogasawara group and 50km from the transmitter and will take up an area 2750 x 120 metres. The frequency range spread over 24 channels is in the range of 5 to 28MHz. Let us trust that none of those channels fall in the amateur spectrum allocations.



Rick NE8Z/HC1MD/HC8MD and a Galapago Turtle.

## THE GALAPAGOS ISLANDS

A note from Alf VK3LC is of interest as he visited this area late last year. Alf is well-known to many for his magnificent work with Intruder Watching in this country and Region 3.

Alf notes that he was a little disappointed in the area of islands. Firstly 'they were very barren and desolate; secondly, the large tortoises were only seen in enclosures at the Darwin Research Centre, just like a zoo. Certainly the authorities are breeding from them and there are several pens in the Centre with young tortoises, but I expected from the brochures and TV documentaries seen, to see them roaming around the islands. Thirdly, the Iguanas. In the brochures etc they appear as large dragon type monsters, but they are small (45 to 60 cm in length) docile creatures'.

Radio-wise, Alf was fortunate in meeting Forest HB8FN and enjoyed a nice chat with him. Forest has Drake twins on 14 and 21 MHz and a three element Yagi up at 20 metres. He noted that he loved the islands and they were his chosen home. Thanks Alf for your actual description of the Galapagos Islands.



## Forest's Card tells its own story.

### PETER 1 ISLAND

Unfortunately Jin JF1IST, apparently had to abort his plans of visiting this desolate area due to transportation problems. So the question now is who is going to be the first to actuate the area. Personal feelings are that it should be left until propagation is better and a reasonable onslaught can be made that will satisfy all continents. Unfortunately economics may dictate and probably will, when a signal can be transmitted from this barren rocky outcrop.

Jon 3Y9WT, has been worked and it appears he is on the Antarctic mainland, whether a check of the Bouvet unattended base will be made on the return trip later this month or early next month is unknown, but it may pay to watch out for a short operation. It has happened before!

## ARGENTINA AREA IDENTIFICATION

The authorities in Argentina use the first letter of the suffix to denote the area the station is operational from, not the numeral. For example A, B and C denote Buenos Aires, D and E the Province of Buenos Aires and Z is reserved for the Arctic and Antarctic Regions. My comment, a strange system!

## LIZ W3CDQ — AGAIN!

A reader has kindly sent me a photocopy of a couple of pages of the 12th Edition of the Wireless

Course published in 1923. Included is a photo of Liz, taken at the Bureau of Standards. A small world that such a publication would still exist and be held by a VK amateur!

#### IMPOSSIBLE? WE MAY BE NOT!

CQ Magazine is awarding a special certificate for the popular Worked All Zones Award to commemorate its 50th Anniversary for those working the 40 Zones between the 1st January and the 31st December, this year. Bands that may be used are 80, 40, 20, 15 and 10 metres.

A challenge ladies and gentlemen and as it is a multi-band and any or mixed award, it may not be so difficult. The difficulty will be in getting the cards, as I see it.

#### SMILE AWHILE

The following is adapted from QRZ DX and originated from the 'Lincoln Log', newsletter of the Lincoln (USA) Amateur Radio Club where K0S0YT came up with some humorous call signs such as SPINE, for a Polish chiropractor, JA1LER, a Japanese prison guard, AH0Y, a Mariannas sailor, CO1N1S, an employee of a Cuban Mint, M1NK, a (former) San Marino furrier, ON1ONS, a Belgium sweet grower and PA1N1S, yes you guessed it, it said you're a Dutch dentist. Sentient apologies to the holders of these call signs (VK3AH).

#### SAVE YOUR MONEY!

Apparently Peter Moore ZM7PM and ZK3PM, is not answering mail addressed to him via PO Box 7344, Wellington South. It would be prudent to hold cards until something starts to materialise from this operation.

#### BITS AND PIECES

A number of new licensees operating from Jordan after the recent examinations. \*\* Dr Prabha KAJIA VU2KJ, is the first YL in India to have passed the Advance Grade of Licence. Congratulations Prabha. \*\* Alain 58RAL quite active again after his holiday in Europe. \*\* OH8OS has eight 5-element 14M 20metre monoband Yagis on a 55 metre high rotatable tower. Can anyone beat that? \*\* Diane 5L2EF runs a DX Net on Mondays at 2030UTC on 14.233 MHz. \*\* Watch for the South Orkney Islands, this and next month. Also VPB South Georgia, shouldn't be overlooked in case of a possible operation. \*\* Willis Lind is presently being activated by Graham VK5ZG, until his tour of duty ends in June this year. \*\* More activity is expected from Christmas Island when Dennis VK9JL returns from holidays in Perth. \*\* Cards from KD7P were being despatched. \*\* Rudi, who was operating from Lord Howe as VK9NM/LH was flown out by the RAAF under emergency medical conditions late last year. \*\* 8P9AF and 8P9AG was a legitimate K6ZM. The authorities made an error. QSL for either call to K6ZM. \*\* If you worked ZF2B4X, don't bank on it being acceptable for DXCC or awards as it appears ZF2 is only recognised by non-residents for use in the Caymans. \*\* Stu, formerly H44SH, is now in the Congo and hopes to receive operating privileges. Don't forget Chris ZL8DY is quite active from Reoul island in the Kermadec group. \*\* TORAI was a special call to celebrate 60 years of broadcasting in Italy. QSL to 8WYD. \*\* UAIAPAP is located in Franz Josef Land. QSL to UZ1OWA via the Bureau. \*\* Luis 982LB, is still quite active around 14.180 MHz at 2200 UTC. \*\* A25/G3HCT made 17 000 contacts in 25 hours of operation mainly on 21 MHz CW. Not a bad effort in anyone's language. \*\* APRR, DXCC Desk, under the control of Don Search, is overworked and they are at the present running five to six months behind on applications and updates. They have advertised for a helper to assist Don in his duties. \*\* H44IA, a keen exponent of the low bands goes QRT this month. \*\* Ron ZL1AMO may make it to the Tokelau Islands next month by air reports. \*\* Club news in France now sport an FF prefix. \*\* Look for Andy HG4SE/AMM, who is aboard his homemade 9.6 metre yacht on a three year cruise which is expected to cover 60 000 nautical miles. He hopes to be in Australian waters by Easter. \*\* EFONG was a special Spanish event station. The EFO prefix is only the second issued. The first belongs to His Majesty King Juan Carlos I. AGQ.

\*\* Unfortunately a fire at the QTH of CTIAES destroyed many incoming QSL cards. If you are waiting a card, it would be prudent to reapply. \*\* Loly EA9RY, is purported to be the first YL to operate from Mellilla, QSL via her OM EA9IB and Pilar EA9AM, was the first YL to operate from Ceuta, QSL via the OM, EA9IE. \*\* The Visalia DX Convention is being held on 16th to 20th April this year.

#### STATISTICS

At 30th July last year, there were 104 287 in civil operations, plus 2 268 Club Stations in the USA. The most popular was the General Class, which accounted for in excess of 116 000 operators. It is interesting to note that up during the month prior to this period 2 050 upgraded with the majority going from the Novice grade to the Technician grade. 307 upgraded to the Extra Class.

#### CAUGHT IN ICE

The Nella Dan, with a crew of 32 and 36 expeditioners and scientists aboard was unfortunately caught up in an unusual 10km ice formation for 47 days, near Amundsen Bay, off Enderby Island, making it land, making it land, Colin VK0CC, and the other 13 members of the scientific team on Heard Island at the appointed time, plus other duties and throwing the complete Antarctic Division schedule due to the time available, into chaos. At the time of writing all systems are go again with the vessel having returned to Hobart after having been assisted by the Japanese 17 200 tonne 'ice-breaker' SHIRASE and guided to safety.

The scientists aboard the stranded vessel had been able to carry out research previously thought beyond their wildest dreams and the vessel and crew of the other Antarctic vessel ICEBERD, in conjunction with the Australian Navy flagship, STALWART, that was hastily diverted from the Philippines and hired by the Antarctic Division, at an estimated cost of A\$250 000, has been doing a sterling job, even if over-worked.

#### QSL MANAGER

A card and note from Luis H8LC, notes that he has been licensed since 1961 and held the position of the Manager of the free incoming QSL service since 1962. Quite a period Luis. My question is how did you manage the time to become the first HI to gain Five Band DXCC, have 31 countries confirmed? The front of your card, noting your achievements, reads like an Award Manual. Congratulations Luis and what is your secret?

Luis's QTH is Luis P Caamano, PO Box 88, Santo Domingo.

#### DX NET LIST

Dieter OE2DYL, a QSL Manager for 21 stations, has updated his DX Net Listing and it now contains over 100 different DX Nets. Dieter is offering it, together with an up-to-date ARRL DXCC list for 11 IRCs. If interested, inquiries should be made to Dieter Konrad OE2DYL, Bessarabierstr.39, A-5020 Salzburg, Austria.

#### WORKED FROM THE WEST COAST

160 METRES  
4371TU, C2MA, FK8OK, JT0GCF  
80 METRES  
DJ5ON159, TAIE, VP2NM, VP2VCW.  
40 METRES  
DJ5ON159, OH1RYC56

#### WORKED FROM THE EAST COAST

20 METRES  
3M2ER, 3YVWE, 4D9RG, 5H3CE, 9J2B0, 9M6EN, 9M8BG, 9ZD7A, 4AKJW, 471BK, CX7BY, E18ED, GWDNNE, O5A, QESL7, QNDRV152, 579CW, 5V0DN/5V8, V6R7C, V56D0, ZK3PM, ZL7AA.

#### THANKS

Sincere thanks are extended to the following: The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, BARG, CO-QSO, DX FAMILY FOUNDATION NEWSLETTER, JAN and JAY OBRIEN'S QSL MANAGER, G1ET, K8B1R, G1EYR, LONG ISLAND DX BULLETIN, QRZ DX, RSGB DX NEWS and THE WESTLAKES AMATEUR RADIO CLUB NEWSLETTER. Magazines including, BREAK IN CW, JACQ, JARL NEWS, KARL NEWS, QST, RADCOM, VERON and WORLD RADIO.

Members and individuals who have contributed include VKs 2HD, PS, ZF and COB BEK, 3EW, FH, YJ, YL, ALJ, AEI, AIX, VK5ZPT, SHD, NE, GANIC and Miss Shirley Toppell. Overseas amateurs include G1E0D, H8LC, OE2DYL, ON7WW, W869Q and ZL1AMM. Thanks to one and all who make this column possible.

#### HONOUR

73 For Radio Amateurs has honoured Jim VK3YJ, for his contributions to the hobby by being Australian columnist for their magazine. The magazine, to celebrate its 25th Anniversary, decided to award 25 Silver Eagle microphones made by Astatic, to individuals that had contributed to the success of the magazine over the years.

A number of observers were contacted who were au fait with the magazine since its inception and asked to nominate individuals. A list of 98 was returned, these after much deliberation, were reduced to 37 and eventually to the 25 recipients who were awarded the prestigious presentation.

Jim, was nominated for the 73 International segment by the 'jury' from 60 amateurs who had forwarded more than 1000 columns since 1963. Quite an honour and congratulations Jim, also to your wife Anne for her typing abilities for the onerous task that you reluctantly took on for the WIA so that this countries flag would be displayed each month. It is known that it took many hours of research, writing and rewriting under, at times, extreme difficulties due to business commitments and the joys of meeting 'deadlines'. Incidentally, Jim was the only recipient outside of the United States, which speaks for itself.



Jim VK3YJ, in the 'shack', with the prized award.

Photograph courtesy Mark Joyce.

#### AUSTRALIA'S OTHR BECOMING OPERATIONAL

The experimental Jindalee Over-the-Horizon radar system, north of Alice Springs will be upgraded at a cost of \$40 million to a fully operational system, this year.

It will be used for the defence of Australia's northern coastline and help to detect illegal immigration and drug smuggling.

The Defence Department claims Jindalee, which has been working on an experimental basis for several years, surpasses similar US and USSR radars.

Additional Jindalee units would probably be required to obtain full coverage of Australia's north and a Defence Department study has to examine this question.

# NOVICE NOTES

## STARTING A RADIO ELECTRONICS WORKSHOP



Drew Diamond VK3XU  
Lot 2, Gatters Road, Wonga Park, Vic. 3115

### PURPOSE

There are many benefits to be had from maintaining facilities for home construction and repair of electronic equipment. The most obvious are:

- *Pleasure and satisfaction derived from 'rolling your own'.*
- *Experience is gained in design and troubleshooting.*
- *Saves money.*

Newcomers to the hobby should give serious consideration to setting up at least the basics of a workshop. The purpose of this article is to introduce some well-known, and perhaps some less familiar items which should prove helpful.

### ACCOMMODATION

The amateur will probably not have much choice as to where he or she may install a workshop. If a choice does not exist however, places which are subject to extremes of temperature, humidity, dust, or noise should be avoided. There are also some more subtle considerations. For instance, an uninsulated metal roof will, under certain weather conditions, allow condensed water to fall from the underside. Also, unsealed concrete surfaces will emit dust and sweat moisture. A timber floor is to be preferred over concrete, as it is possible to stand for longer periods without fatigue. If carpet can be arranged, so much the better (don't fall into the habit of flicking solder onto the floor, however!).

The workbench should be about waist height, with a three or four legged stool to suit. The bench should be located near a window, preferably under it, so allowing work to be done with natural light during daytime, and will prevent a feeling of being cut-off from external activities. A raised shelf with a depth of about one third that of the bench will be found handy to accommodate the most oft used test equipment (see photo). The full area of the bench can then be used productively. An incandescent lamp on a flexible arm should be provided. Fluorescent tubes generate considerable radio-noise, so this must be kept in mind when working on sensitive equipment, such as receivers.

### STORAGE

Amateurs are great hoarders. We collect 'stuff' from all sorts of sources, knowing that it will be useful — one day. There are lots of storage devices available now. Some of these, and cheaper methods are outlined below:



Photo 2 — Willow Storage Bin (plastic drawers).

• *Willow, Capstan, and Ikea make a range of storage bins and drawers (see photos 2 and 3). Unprotected CMOS and FET devices should not be stored in plastic boxes however, due to the likelihood of damage by static electricity.*

• *Magazines, books, and the larger electronic parts may be stored in wine casks (see photo 4).*

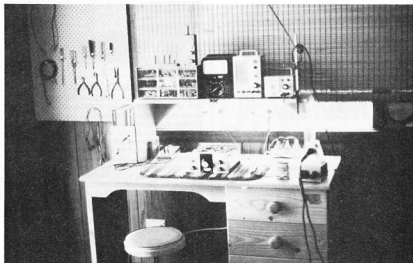


Photo 1 — Suggested Bench Layout.

*The bag has been removed and the tap end cut out with a sharp knife.*

• *Components, screws, nuts, etc, may be stored in small jars. Baby food jars are ideal for this. One method is suggested in photo 5.*

• *A methodical filing system should be established early. Metal filing cabinets sometimes become available through disposals sources. Until a reasonably priced one can be located; a cardboard box may be employed. The local supermarket should be able to oblige. More robust boxes are also available from office equipment suppliers.*

• *Photo 1 also shows a handy way of storing tools upon golf tees plugged into a peg board. If mounted near the workbench, circuits may be attached for easy reference whilst working.*

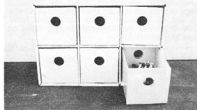


Photo 3 — Ikea Storage Bin (cardboard drawers).



Photo 4 — Wine Cask Magazine/Book Storage.

### TOOLS

Some basic metalworking tools were mentioned in Novice Notes, December 1985. For radio electronics work, a basic kit would consist of several small screwdrivers — both plain and Phillips, long and business pliers, wire cutters, and perhaps a set of nut drivers. More specialised items may be acquired later as required. For printed wiring and general soldering work; a 25W iron should prove satisfactory. A temperature controlled unit is to be preferred of course, but these are rather costly.

### INSTRUMENTS

Very little serious electronics work can be done without a multimeter, so this must be number one on any list of acquisitions. A meter with voltage DC and AC, current DC and AC, and resistance (ohms down to  $\times 1$ ) will do the job. The choice of analogue or digital must be left to the individual, as both types have their pros and cons.

An audio amplifier will be found to be very handy, particularly if an RF detector probe can be added for receiver work.

There is plenty of published data for small power supplies. One of 0 to about 20VDC at 1A should receive early consideration.

For the radio enthusiast; a dip oscillator must be just about the handiest thing going, and construction of a dipper would provide valuable experi-

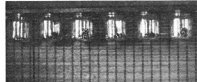


Photo 5 — Baby Food Jars.

ence. References 1, 2, and 3 have details. There are one or two ready-made units available, but be prepared for a shock when you hear the price.

As confidence and experience increases, an oscilloscope, frequency counter, and even a signal generator may be added to the "five-year-plan".

#### FURTHER READING

- 1 Radio Handbook — Orr
- 2 Radio Communication Handbook — RSGB
- 3 Novice Notes — AR May '82
- 4 Radio Servicing Pocketbook — Capel
- 5 Radio & Electronics Laboratory Handbook — Scroggie
- 6 Electronics Workshop Manual & Guide — Groffe

AR

## Magazine Review

Roy Hartkopf, VK3AOH

34 Toolangi Road, Alphonso, Vic 3078

(G) General; (C) Constructional; (P) Practical without detailed constructional information; (T) Theoretical; (N) Of particular interest to the Novice; (X) Computer Program

**SATELLITE JOURNAL ... OCTOBER 1985** — General Satellite News, Beginners Guide (G) Q S T ... SEPTEMBER 1985 — Californian Bushfire Emergency (G), Principles of SSB (N), Loop and Dipole Comparisons (T), Frequency Modulation (T) Q S T ... OCTOBER 1985 — 902-144MHz Converter (C), 1985 APRIL DX Contest Results (C) ... AUGUST 1985 — Special Antenna Issue, "Zero Bias" Editorial.

**HAM RADIO ... OCTOBER 1985** — Repairing Water Damage (G), Transmission Lines (G) **RADIO COMMUNICATION ... DECEMBER 1985** — HF Convention, Emergency Follows (G) **RADIO ELECTRONICS ... OCTOBER 1985** — Plywood Satellite "Dish" (C) **BREAK IN ... SEPTEMBER 1985** — RTTY Issue **WORLD RADIO ... NOVEMBER 1985** — New A4 Format, World Amateur Radio News, Contests, AMTOR, Maritime, etc. **CQ-TV 131 ... AUGUST 1985** — 1.3GHz Power Amplifier, 70cm Probe, 24cm Through-line Power Combiner, etc. General ATV information and Circuits

AR

### CORDLESS PORTABLE COMPUTER

The first commercially available portable computer, with a radio modem and transceiver is now available in the USA.

Known as the EST Quest Portable, it uses a 32 kbyte lap-top NEC 8021a computer. The modem and transceiver are neatly built into the bottom of the computer in a package weighing 4.5kg.

Using one watt transceivers on 72MHz, the unit transfers data using packet technology at 2400 Baud.

Developed by the American Telephone and Telegraph Company, it will be marketed for its portability and ability to eliminate the need for extensive wiring of buildings to link computers.

### HEATERS BANNED

A range of new industrial heaters which interfere with aviation communications have been banned. The heaters concerned used radiation as part of the heating process. The radiation is of a similar frequency to that used for ground-to-air communications.

The heaters could cause interference which may threaten air safety, particularly when airports are close to industrial sites.

A new standard under the Radiocommunications Act limiting the permissible level of radiation from such equipment is now in force. The industrial heaters standard is one of the first under the Act which authorises stiff penalties for use, possession or supply of sub-standard equipment.

## A R Showcase



### NEW 2m FM MOBILE TRANSCEIVERS

The Kenwood TM-2530A/TM-2550A/TM-2570A two metre FM mobile transceivers have been designed to satisfy the needs of the most demanding two metre operator. A wide range of innovative features have been incorporated in the basic design, including a large, new, easy-to-read LCD display, 23 multi-function memory channels for storing frequency, offset, telephone number and sub-tone (sub-tone unit optional), auto-offset, programmable priority, memory and band scans, automatic centre-stop tuning, and HiLo power selection. The new "25-Series" offers 2m FM mobile transceivers in three power output versions.

Australia will only be stocking the TM-2570A, which is the 70 watt model. This will be available this month.

An optional MU-1 DCL (Digital Channel Link) unit provides a revolutionary new signalling capability, giving the operator maximum flexibility and efficiency in his normal, day-to-day contacts, or in high speed net operations. Easy-to-operate front panel controls provide the final touch, making this new 2m series easily the last word in state-of-the-art technology.

For further information about the Kenwood range of products contact Trio-Kenwood (Australia) Pty Ltd, 4E Woodcock Place, Lane Cove, NSW, 2066 or one of the Kenwood dealers listed on page 51, January AR.

AR



### RADIO AMATEUR ALSO BUILDS MODELS

Roy Stephens ambitions to be a Marine Engineer were interrupted when at 15 he contracted Polio. A recovery period taking many years produced an opportunity to study electronics at RMIT which led to a career in radio and communication maintenance, as well as a Broadcast Operators Licence and the call sign VK4BRS.

Roy, who now resides in Flaxton, Queensland, spends a busy retirement building live steam scale model locomotives which are capable of hauling 12 adults!

The photograph shows Roy using a Superscope soldering iron which he describes as his constant companion since the early 1950s, working on an 0-6-0 (wheel configuration) tank loco. It is a freelance model of the tank locos used to haul on suburban lines before electrification.

AR

### UNDERWATER VIDEO SOUNDER

The Imark DM-60 Video Sounder is for use by the



serious sport-fishermen and pleasure boaters.

It is a 146 metre (480") compact, lightweight depth sounder which utilises a 15cm (6") CRT screen instead of the usual chart paper to display the sea bottom, reefs, and fish beneath the vessel. Thus, it is not necessary to buy chart paper.

The DM-60 has six basic depth ranges of 0-10, 0-20, 0-40, 0-80, and 0-160 metres. A zoom facility enables the top half or the bottom half of each screen to be displayed over the entire screen. This action immediately doubles the resolution of the display. There is also a Freeze Frame facility.

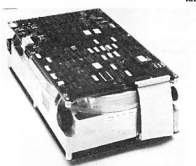
An electronic alarm facility is incorporated which provides both a shallow and a deep alarm. These settings are displayed on the CRT. The alarms can be set to sound when the depth of water becomes deeper than the deep setting and likewise with the shallow setting.

The control panel is back-lighted for night use and is easy to operate. It also includes controls to select the sweep speed, to impose a screen over the CRT display as well as gain, Shallow alarm, deep alarm, screen brightness and power ON/OFF. The CRT also displays the battery voltage.

The DM-60 Video Sounder operates from a normal 12 volt battery and draws only 1.8 amps. Dimensions are 135 (H) x 205 (W) x 230 (D) mm and weighs 205kg. It comes complete with DC cable, mounting bracket, sun shade hood, operators manual, and appropriate 200kHz transducer.

Further details can be obtained from the importer, Imark Pty Ltd, 167 Roden Street, West Melbourne, Vic. 3003.

AR



### NEW STORAGE OF 516 MBYTES

The Priam's 808 Advanced Series 8" voice coil technology drives are designed to provide improved data storage and management in multuser and local area network systems.

Although packaged in an enclosure no bigger than a standard eight inch floppy drive case, the 808 Series rivals the performance characteristics of the stand alone "washing machine" storage units.

A 20 milli-second average access time and a transfer rate of 1.81 Mbytes per second yield performance complementing mini and mainframe applications. Two additional bonuses of the 808 Series are the low power dissipation of 85 watts and the minimal weight of 10 kg. No special allowances for either cooling or floor load need be made.

The 808 series drives offer ESMD and Priam interfaces while lower capacity drives (227 MByte and 344 MByte) from the same series have as their options SMD, PRIAM, SCSI and ANSI interfaces.

For further information contact Priam's Australian Agent: Daneva Australia Pty Ltd, 64-66 Bay Road, Sandringham, Vic. 3191, phone (03) 598 5622 or 47 Falcon Street, Crows Nest, NSW, 2065, phone (02) 957 2464.

AR

## PORTABLE ANTENNAS FOR 27 AND 500MHz

Scalar Industries have designed a series of continuously loaded mobile antennas for portable and 'Walkie Talkie' applications which are ruggedly constructed to withstand rough handling. These 'stubbies' may be bent to almost any angle without cracking the protective black PVC finish and therefore cannot accidentally be shorted out.

They are for the frequency range from 27 to 500MHz. An excellent range of connectors are available including BNC; Motorola; Push-on (fits 10mm);  $\frac{1}{8}$ " x 26TPI Ferrule; TNC; UHF (PL259); N types and many more.

Of particular interest are models M99RC suitable for roof mounting in mobile vehicle installations. These are supplied tuned to a specifically matched base for improved VSWR. M99RCHD with Ferrule and matched base is especially developed for ambulance use. The M99RT is for hand-held transceivers and equipment with  $\frac{1}{8}$ " x 26TPI stud. Also the M99RC is normally a flexible antenna, but it can be supplied with a factory fitted internal stiffener which will convert it for heavy duty use. Always specify operating frequencies connector type and application when ordering.

For further information contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137, phone (03) 725 9677 or branch offices in Sydney (02) 502 2888; Brisbane (07) 395 1188 or (07) 395 6171; Perth (09) 446 9177.

AR

## RF CONTROL YAGIS

The new Scalar 9dB UHF RF control directional Yagi antennas which are now available are six or nine element models with frequencies 450-470MHz; 470-490MHz and 490-510MHz. VSWR is 1.3:1 and nominal impedance is 50 ohms; termination is cable tail to N type female and power rating is 250 watts. These RF control links are manufactured from high grade seamless aluminium tubing and conform fully to the relevant draft specification RB 234C.

Scalar also manufacture high quality Yagis to other frequencies and gains to suit the customers particular requirement.

For further information contact Scalar Industries Pty Ltd, 20 Shelley Avenue, Kilsyth, Vic. 3137, phone (03) 725 9677 or branch offices Sydney (02) 502 2888; Brisbane (07) 395 1188 or (07) 395 1817; Perth (09) 446 9177.

AR

## SAM DOES IT AGAIN

Sam VK2BVS, completed the 14km Fun Run from the Sydney Town Hall to Bondi Beach in 99 minutes 2 seconds. Using the call sign V12BVS, to celebrate the 75th Anniversary of the WIA, with a two metre whip (flying the Australian flag), Sam joined 15 000 other enthusiasts in the 15th Annual City to Surf Run, held on 4th August 1985.

WICEN provides communications for this event so Sam was not short of moral encouragement and the occasional eyeball along the way.



## CORRECTION CORNER

Loading up on 1.8MHz, Page 13, December 1985

Third paragraph under heading TESTS —

ItRp should read It<sup>2</sup>Rp

IaRr should read Ia<sup>2</sup>Rr

Appendix 1 —

Xi<sup>2</sup> = RpRa - Ra should read

Xi<sup>2</sup> = RpRa - Ra<sup>2</sup>

Equation 5 should read

$$Xi + \frac{Ra^2}{Xi}$$

## AUSTRALIAN CONTINENT SPANNED DIGITALLY

Installation of the world's largest digital radio trunk system has been completed by Telecom Australia and it stretches 5 100 km from Perth to Brisbane.

The 140 megabit per second system, costing \$73 million, would carry large volumes of voice, data, text, sound, and television traffic with high reliability.

It can accommodate up to six radio bearers, each of which could carry the equivalent of almost 2 000 simultaneous telephone conversations or a number of television relays.

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# Contests



Ian Hunt VK5QX  
FEDERAL CONTEST MANAGER  
Box 1234, GPO, Adelaide, SA 5001

## CONTEST CALENDAR

<b>FEBRUARY</b>	
1-2	RSGB 7MHz SSB Contest (Rules January issue)
8-9	QCWA CW QSO Party (Rules this issue)
8-9	YL-SSB Phone Contest (Rules this issue)
8-9	YL-CW Phone Contest (Rules this issue)
8-9	DL-SSB Contest (Rules this issue)
15-16	1986 ARRL DX CW Contest (Rules January issue)
21-23	CQ WW 160 metre SSB Contest (Rules January issue)
22	RTTY Journal Contest (Rules this issue)
22-23	French Phone Contest
22-23	RSGB 7MHz CW Contest (Rules this issue)
22-23	YL-CW Contest (Rules this issue)
22-23	USA SSB Trophy Contest (Rules this issue)
<b>MARCH</b>	
1-2	ARRL DX Phone Contest (Rules January issue)
8-9	QCWA Phone QSO Party (Rules this issue)
8-9	Commonwealth Contest 1986 (Rules January issue)
15-16	Bermuda Contest
15-16	YL-SSB Contest (Rules this issue)
15-16	John Moyle Memorial Field Day Contest (Rules this issue)
22-24	BARTG Spring RTTY Contest

Preparation of material for this issue has presented me with an extremely heavy workload. My visit overseas was extended beyond what I expected and has resulted in some difficulty in even producing the results of the Remembrance Day Contest for this issue. This also means that the publication of the results of the 1985 VK Novice Contest will have to wait until March.

Comments on the RD Contest logs will also be held over.

**Congratulations are due to the VK1 Division on their win in the RD.** It would appear that the formula in use for some time, to determine the winning Division, might mean that some surprises are in store in the future.

I have not had time to make a detailed analysis of the final results, although I find it interesting to note the change in situations now that the participation percentage from each Division no longer plays a part in the formula. Divisions listed in order of the results and the participation calculated by the number of logs submitted as a percentage of licensees in each Division are as follows:

VK1 - 25.7; VK4 - 2.8; VK3 - 1.8; VK6 - 8.2; VK5 - 7.7; VK2 - 1.4; VK7 - 4.5.

I am not really sure just what all this might mean, however those coming out there are statistically minded might have some fun doing even more adding, subtracting and multiplying, etc.

The Field Day Contest next month is one event which I always look forward to as being one of the really fun events on the contest calendar. I find it most enjoyable getting out into the back-woods and seeing what strange things are going on from whatever supports are available. It is quite surprising just how you can develop your throwing arm and the accuracy you can achieve at placing a line into one particular fork on a branch of a tree.

This year there are not many changes to the rules for the Field Day Contest. The major difference between this and last year's contest is the replacement of a totally separate section for VHF operation. Some of the rules have been slightly added to so as to provide clarity of their intent, whilst some additions have been made to close certain loop-holes which have existed for some time. I would again suggest that you make yourself familiar with all aspects of the rules of any contests that you may enter. One of the changes you may note is that VHF contacts over the shorter distances do not carry the benefit of a multiplier.

As indicated in the January issue, the Federal Executive advised me that discussion regarding the CW Contest resulted in a decision to remove this from the calendar. In an effort to resolve the problems surrounding this subject, a suggestion was made by Wally VK2DEW, who is a previous Federal Contest Manager and the Alternate Federal Conciliator for the VK2 Division. The suggestion to use the Federal President's Cup as a trophy to be awarded on an annual basis to the top CW scorer in the Field Day Contest is certainly a good one, and I am indebted to Wally for his continued interest and help.

You might note that in this issue I have provided a fairly comprehensive listing in the Contest Calendar. One of my aims in doing so is not merely so that you can enter every contest that comes along, but rather that you might become just a little more informed as to just how many contests are conducted. Perhaps someone from one of the Divisions might like to take up the challenge and produce a substantial case to be presented to the next Federal Convention to the effect that there really are too many contests on our bands. I know that I don't have time to keep track of them all. I even had difficulty trying to provide some amount of help to Ken VK3AH, who is constantly making a valiant effort to produce a yearly calendar.

Time permits me no further comment this month, so you might breathe a sigh of relief at that time. Meantime, I hope to catch up on so many other matters. Completion of the 1985 Field Day Certificates, Contest Championship Trophy Results, Novice and Ross Hull Contest Results, RD Certificates to organise, as well as try to find time to do some of the necessary work around the house, and even spend a few moments on the air for myself. I certainly want to be able to find a moment to read further about the adventures of Bill Blithering and wonder whether it might, after all, be more fun to live such a carefree life in the fashion that he does.

Good luck to you in the coming events and watch out for our next main item which is the 1986 Novice Contest, to be held in June. It could be quite an interesting one this year.

## REMEMBRANCE DAY CONTEST - 1985

### RESULTS

The formula for the determination of results for each Division is:

Total Points/Total Divisional Licences multiplied by weighting factor.

VK1	3068/307	x 1.08	18.68
VK2	5067/4830	x 7.81	8.193
VK3	14189/6846	x 5.96	12.352
VK4	6602/2492	x 5.83	15.44
VK5	16658/1749	x 1.61	11.46
VK6	122170	x 1.26	11.57
VK7	2871/579	x 1.27	6.297

Note: VK3 points and licence totals are added to VK5  
VK3 points and licence totals are added to VK6

### DIVISIONAL SCORES

VK1	VK4	VK6
HF Phone 3198	HF Phone 4801	HF Phone 4590
VHF Phone 2171	VHF Phone 517	VHF Phone 584
<b>TOTAL 5369</b>	<b>TOTAL 1286</b>	<b>TOTAL 7185</b>
VK2	VK9	
HF Phone 3522	HF Phone 1206	
HF CW 1496	HF CW 1151	
VHF Phone 49	VHF Phone 519	
<b>TOTAL 5067</b>	<b>TOTAL 3451</b>	
VK3	Grand Total for VK6 and 6 is 12878	
HF Phone 9835	HF Phone 84	
VHF Phone 3464	HF CW 38	
<b>TOTAL 14189</b>	<b>TOTAL 122</b>	
	Grand Total for VK5 and 5 is 16788	

Licenses per Division are as follows: VK1 - 307; VK2 - 4830; VK3 - 6846; VK4 - 2492; VK5 - 1749; VK6 - 1394; VK7 - 579; VK9 - 120.

The following logs were submitted late and were not accepted for inclusion in the contest - VK6 2BTPP, 34WSP, and 5APC.

### INDIVIDUAL SCORES

#### VK1 High Frequency Section A (Phone)

PJ	845	LF	121	NEB	62	NUB	33
GB	508	KAL	114	DH	54	KEN	32
ZL	292	BAT	100	KCM	50	JX	29
HZ	196	GD	100	NMW	49	BBA	25
NCO	140	MX	100	KDE	44	TOTAL	319
PP	137	FM	98	RM	41		
DA	122	NLP	70	RH	36		

#### VK1 Very High Frequency Section A (Phone)

KAL	181	72NP1	80	LF	74	2PU1	41
ZAR	130	ZJB	79	BAT	73	HZ	46
ACA	128	3XGV1	79	KEN	68	KCM	37
GL	126	3KQNP1	79	MX	67	WHI	35
ACC/P	103	KCB	79	UE	58	ZZD	33
GB	102	ZJR	78	KDE	50	JX	29
ZAH	94	ZXA	76	DA	48	FM	29
ZL	86						27
						TOTAL	217

Grand Total for VK1 is 5369

#### VK2 High Frequency Section A (Phone)

Call Sign	Score			
DLB	139 RE	101 AIC	59 FJ	41
DHU	158 CKM	100 KGX	56 CP	40
ELB	155 CDQ	99 AZS/1	54 DEW	36
CJP	140 KAL	99 JX	53 JX	35
BID	140 EXA	99 VSN	52 BHO	32
ERJ	130 FUN	83 AJO	51 SW	31
PN	125 CKW	79 NV	50 ALU	31
GP	125 UC	75 CF	50 VMX	30
ALZ	120 PY	64 PTK	45 DDB	30
DUA	108 DJJ	63 GI	44 CCZ	29
SA	103 DXG	62 BOT	41 BXO	27
IV	101		TOTAL	3522

#### VK2 Very High Frequency Section B (CW)

VX2 Very High Frequency Section 2 (CW)							
Call Sign	Score						
BOQ	139	II	102	EO	52	AIC	37
KM	127	BHO	98	GT	50	PUG	34
EL	124	ZC	80	QL	50	ETE	34
TR	122	CQP	67	SU	42	ED	31
ADF	106	AZR	61	VM	40	TOTAL	1489
		DOL	60	JLM	38		

Check logs were received from VK2s CWS and CDG

#### VK2 Very High Frequency Section A (Phone)

Call Sign	Score
HT 49	
<b>TOTAL 49</b>	

Check log was received from VK2EL6

#### VK3 High Frequency Section A (Phone)

Score								
BUR	487	CPS/P	153	ZZ	106	AAM	50	
BMV	481	BSR	133	VCQ	106	MJ	49	
APC	430	CAC	133	WIA	104	AMQ	49	
CJW	408	NOH	128	CNE	104	BKH	49	
PD	384	CQP	127	GCM	91	DRY	44	
BRZ	365	ABP	125	BJM	90	PTH	43	
GP	343	QP	123	DFI	90	DWF	43	
ADW	306	Y	120	BHN	85	PNP/P	37	
DSI	294	AKK	120	VDG	82	HLR/P	36	
VJ	287	AVS	118	KPP	75	KDD	36	
BM/LP	257	AKK	117	KNM	75	AH	35	
BSP	230	BFN	115	NBWP	75	UV	35	
CJF	222	CX	114	GA	72	AMD	35	
VJ	222		114		70	BMY	31	
AVV	210	CAD	112	OM	69	BMH	31	
21	196	AGJ	112	GZ	66	PAF/P	30	
BW/P	191	ZJ	110	BHS	63	DNM	29	
81W	181	AYF	110	BJI	58	DRN	29	
DGZ	157	BHUP	109	BGY	51	TOTAL	2835	
					JK	106	KF	80

Check logs were received from VK3s ARJ and XH

#### VK3 Very High Frequency Section B (CW)

VK3 Very High Frequency Section B (CW)							
Call Sign							
	Score						
CCG	124	XB	75	BHU/P	45	VCC/P	31
YK	101	BDH	66	CGE	45	JL	30
DVW	86	BGH	64	KS	40	TOTAL	890
DG	80	RJ	58	BXA	35		

Check log was received from VK3AMG

#### VK3 Very High Frequency Section A (Phone)

VKS very high frequency section A (Priority)				
CGH	471 BI	110 DKP	66 BYA	41
XPT	230 BY	108 BER	64 BZQ	40
XDJ	201 YMT	103 DNM	61 CWA	39
APC	184 BFN	91 XH	52 OM	36
YSY	161 KRS	91 BIR	52 JK	36
BHN	155 CQP/P	89 BDB	44 YNS	32
138 ADW		78 BRZ	44 AOM	31
BHUP/P	133 KPP	75 KCT	43 XY	25
YKT	115 BKN	71 CAC	41 TOTAL	346
XNI	113			

Check log was received from VK3BSP

Grand Total for VK3 was 14189

# **VK4 High Frequency Section A (Phone)**

Call Sign	Score								
SHB	308	AEJ	138	ANU	60	PJ	37		
YH	284	AM	121	BEM	60	ADY	34		
AUR	260	OF	110	ASB	59	ALO	31		
VR	108	AAK	58	RV	30				
AQH	232	BG	103	YX	55	ZN	30		
ZV	227	LT	102	ACW	55	AGS	30		
BKM	102	SJA	51	CZ	30				
RC	220	AGL	98	AMB	47	ADL	30		
AOD	198	W5	90	AOE	45	BPD	25		
GOR	162	BRZ	73	KH	41	AVR	25		
BCS	70	NEL	73	AVR	40	UG	25		
BTB	146	YN	68	KJD	38	TOTAL	4801		

## **VK4 High Frequency Section B (CW)**

Call Sign	Score								
XA	202	YJ	66	SF	45	BDG	31		
FB	75	XW	62	NUN	34	TOTAL	515		

## **VK4 Very High Frequency Section A (Phone)**

Call Sign	Score								
ZML	260	VR	97	AMA	43	PJ	31		
AUR	238	AGD	87	AIA	41	BHL	27		
AOX	131	KH	88	BS	35	VS	26		
AVR	108	ASB	48	QW	34	TOTAL	1286		

Check logs were received from VK4s RX; BG; and YN  
Grand Total for VK4 is 6602

## **VK5 High Frequency Section A (Phone)**

Call Sign	Score								
BJA	637	ABX	185	GV	77	SON	30		
OX	600	BAR	151	AGZ	73	RK	36		
FF	543	SEA	144	AGP	71	AIM	35		
ADD	534	AAJ	138	NWT	70	FS	35		
LZ	482	AJW	125	NOP	65	KJT	34		
EE	472	AT	115	OT	62	YV	32		
ACW	464	JJ	115	ATC/P	61	AWM	31		
BYL	388	AC	115	ST	61	WO	31		
BU	376	PNJ	115	ABS	59	YV	30		
ALF	373	AJG	111	KLJ	58	VV	29		
ATN	369	IT	106	AMF	56	EC	28		
CJ	361	TS	105	TP	56	DF	28		
OK	332	SS	103	EA	53	KAK	26		
ZJ	325	RH	100	NIA	52	KGS	26		
SJ	309	LL	100	KOP	51	2B	26		
GG	268	AT	92	ARM	51	RV	25		
BI	260	AVJ	91	PBY	50	NPA	25		
NOD	253	HF	87	KV	46	ADK	25		
EC	200	AGL	85	YO	42	EA	25		
ARC	198	BPA	81	NEI	40	TOTAL	12064		
GZ	186	CO	79	NAC	40				

Check logs were received from VK4s HM; ANW; KC; ALD; BKO; and FX

## **VK5 Very High Frequency Section B (CW)**

Call Sign	Score								
BN	184	OTZ	93	BS	64	FN	27		
AOX	157	AT	89	FM	59	LI	26		
UM	143	FX	74	TL	35	TOTAL	1151		
BO	108	HO	72	JG	30				

## **VK5 Very High Frequency Section B (CW)**

Check log was received from VK5ZB

## **VK5 Very High Frequency Section A (Phone)**

Call Sign	Score								
JJ	230	ZDJ	120	ANW	67	AWM	41		
KPM	229	KLH	108	KEM	63	ARD	36		
KJF	217	RV	104	ZAL	63	AD	31		
IF	197	AT	97	KCI	58	YU	30		
ZHL	173	FN	92	OV	56	ATN	27		
MS	158	YV	90	BAR	54	BKG	26		
AOX	128	ZSV	76	ZTJ	51	KGS	26		
BPA	149	TC	71	HE	46	EA	25		
AAC	142	AIM	70	AOV	46	TOTAL	3451		
ABX	121	AT	70	NX	45				

Check log was received from VK5FX

## **VK6 High Frequency Section A (Phone)**

Call Sign	Score								
DI	84								
TOTAL	84								

Check log was received from VK6NW

## **VK6 High Frequency Section B (CW)**

Call Sign	Score								
HA	38								
TOTAL	38								

Combined Grand Total for VK5 and VK6 is 26788

## **VK6 High Frequency Section A (Phone)**

Call Sign	Score								
ED	455	DA	107	WL	66	ABM	44		
ED	443	UP	61	UT	61	UT	44		
CT	226	ANL	102	TO	62	OE	33		
RG	224	LZ	102	AV	60	KY	32		
AOX	160	GL	101	LV	59	ANT	30		
AMB	150	TX	89	OP	58	ABS	32		
AOU	141	RZ	88	ARG	51	RO	30		
AO	125	GN	75	FE	51	SAA	30		
ANC	121	WU	73	NCE	50	HU	30		
ZQ	120	ADU	73	YL	48	NRA	29		
CX	115	AP	68	SD	47	UW	27		
ATE	112	NM	55	AR	46	AD	26		

DM	26								
NPL	26								
AFB	26								
XZ	25								
TOTAL	4590								

Check logs were received from VK6s GH; OH; and DC

## **VK6 High Frequency Section B (CW)**

Call Sign	Score								
HO	179	AJ	89	SM	39	WZ	27		
AFQ	96	JU	59	SD	35	WT	29		
				RZ	34	TOTAL	584		

## **VK6 Very High Frequency Section A (Phone)**

Call Sign	Score								
ZLZ	301	ZRY	191	SI	136	DC	53		
ZLZ	287	SDW	189	DA	131	ML	52		
XZ	252	WT	184	EU	119	UV	50		
NO	250	VL	180	NS	101	AOX	50		
CX	240	SO	179	VF	100	SAA	49		
ABD	234	TX	176	TP	100	JU	46		
VF	217	ACN	159	ZOA	100	KBL	46		
ZMG	203	FC	157	PV	80	ABS	32		
WJ	191	ANC	155	GH	75	UJ	29		
WJA	189	ZBM	152	MM	74	ZTL	28		
TO	198	ANJ	151	ZRE	HM	71	ZAG	27	
WH	196	NE	149	HI	70	GA	27		
ACG	192	JP	143	AI	58	TOTAL	7185		

## **VK9 High Frequency Section A (Phone)**

Call Sign	Score								
XZ	242								
XJ	222								
XD	55								
TOTAL	519								

Combined Grand Total Scores of VK6 and VK9 were 12878

## **VK7 High Frequency Section A (Phone)**

Call Sign	Score								
KC	434	KV	151	RM	60	BH	34		
WJW	308	NAJ	134	NBF	80	AK	26		
KZ	285	ANI	105	HD	58	OM	25		
BD	272	JE	90	HW	50	TOTAL	2657		
FL	171	FL	85	DO	71	GA	27		
NCP	166	JU	62	BJ	36				

## **VK7 High Frequency Section B (CW)**

Call Sign	Score								
Score	33								
TOTAL	33								

## **VK7 Very High Frequency Section A (Phone)**

Call Sign	Score								
RM	60								
NW	59								
FL	39								
HD	26								
TOTAL	181								

Check log was received from VK7AK  
Grand Total Score for VK7 was 2871

## **ZL High Frequency Section A (Phone)**

Call Sign	Score								
1AG0	112								
3TX	66								
4QY	44								
4CP	35								

## **P2 High Frequency Section A (Phone)**

Call Sign	Score								
9NJS	33								

## **Section C (Receiving) High Frequency (Phone)**

Name/No	Score								
John Hagen	507	L20283							
L20349	217	L20036							
L20371	185	L20068							
N Desjardins	113	G Edmeades							

## **Very High Frequency**

Name/No	Score								
L10120	157	L50085							
Greg Fullam	305	G Edmeades							
David Owen	152	L20068							

A non-scoring Check Log was also received from VK7SA which was operated by the Mackay Radio Club

## **JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST 1986**

Contest Period: From 0100UTC 15th March to 0700UTC 16th March 1986.

**Object:** To encourage portable operation on the amateur bands by Australian operators. This form of activity is intended to help operators to become familiar with portable operation and thus assist in training them for preparedness in emergency situations. Emphasis is placed on working between field day/VK stations in a manner as might be expected in an emergency situation.

**CALL AREA DEFINITION:** a Within ones own call area. VK1 to VK1 etc.  
b Outside ones call area. VK1 to VK2; VK1 to ZL etc.

## **Rules:**

1 DIVISIONS: There will be TWO divisions — a 24-hour and b 6-hours. In each division the operating period must be continuous within the time period allocated for the contest.

2 SECTIONS: In each division there will be separate sections as follows:

- a Portable Field Station, transmitting phone, single operator
- b Portable Field Station, transmitting CW, single operator
- c Portable Field Station, transmitting open, single operator
- d Portable Field Station, transmitting phone, multi-operator
- e Portable Field Station, transmitting CW, multi-operator
- f Portable Field Station, transmitting open, multi-operator
- g Portable Field Station, transmitting VHF, single operator
- h Home Transmitting Station, emergency powered
- i Home Transmitting Station, mains powered
- j Receiving Stations

3 STATION DEFINITION: A portable field station is one which operates from a power supply which is independent of any permanent installation. The power source must be fully portable, ie batteries, solar panels, wind or motor generators, etc. A station located in an automobile and completely self-contained, apart from antennas, is classed as being portable, whether in motion or not.

A single operator station is one where the work involved in setting up the station is carried out by one operator and where this operator is the one who makes all contest contacts from the station. This does not, however, preclude the operator from having such minimal support such as a log keeper, provision of food and drink, etc. This definition debars such practices as entering a Club Station using a single operator with massive support, in competition with stations which are set up and operated by an individual operator in the normal sense of the word.

It is considered that the terminology of multi-operator station is self explanatory.

4 INSTALLATION: No radio apparatus, including mast, antennas, feeder cables, etc, may be erected on the site more than 24 hours before the contest/s begins/ing operating.

5 BANDS: All amateur bands may be used with the exception of the 10, 18 and 24MHz bands.

6 CONTACTS: Cross band contacts are not permitted. Cross mode contacts are permissible, however they will count only as phone contacts for scoring purposes.

7 The size of any portable field day station shall be restricted to approximately that of an 800 metre diameter circle.

8 MULTI-OPERATOR STATIONS: Such stations will provide a separate log for each band

— one point  
**CONTACTS OUTSIDE AUSTRALIA:**  
 g Contacts with overseas stations, ie other than VK — two points  
**Home Stations/Emergency Powered —**  
**CONTACTS WITHIN AUSTRALIA:**  
 a Portable/Mobile outside entrants call area — 15 points  
 b Portable/Mobile within entrants call area — 10 points  
 c Home Stations/Section H irrespective of call area — five points  
 d Home Stations/Section I irrespective of call area — one point

**NOTE: Home Stations/Emergency Powered must operate independently of mains power. Such a proviso serves to further the aims of the WIA to prepare operators for emergency situations.**  
**For Home Stations/Mains Powered —**  
**CONTACTS WITHIN AUSTRALIA:**  
 a Portable/Mobile outside entrants call area — 15 points

b Portable/Mobile within entrants call area — five points  
 c Home Stations/Section H irrespective of call area — one point  
 11 VHF/UHF MULTIPLIERS: For contacts made on frequencies from the 50MHz band and upwards, the QSO points score for each contact is multiplied as per the following table:

DISTANCE	MULTIPLIER
Under 50 kilometres	1
50 — 150 kilometres	5
150 — 300 kilometres	10
over 300 kilometres	20

**12 BONUS POINTS:** For any contact made using a NATURAL power source, a bonus score of 10 points may be added. A Natural power source is regarded as one where power is derived from such as solar cells, wind, methane gas, etc, as well as from batteries which are completely charged by natural means. All power produced under this category must have been derived independently of commercial mains or the use of petroleum derivatives.

**13 CW CONTACTS:** CW to CW contacts earn double points. These points must be shown as claimed on the log sheet prior to the application of any multiplier or bonus points. **NOTE: See below regarding CW Trophy under Rule 22.**

**14 REPEAT CONTACTS:** Repeat Field Stations and Home Stations under Section H may contact other stations within these categories (Section A to H) for repeat contacts provided that a period of at least three hours has elapsed since the last contact with the station concerned. Home stations operating under Section I may be contacted provided that a period of at least six hours has elapsed. This applies for each band and mode.

**15 RECEIVING STATIONS:** Stations in this section must record the serial number being sent by any of the stations operating in the contest within Sections A to G inclusive. QSO points scoring will be on the same basis as for Home Stations/Section I as per Rule 10 above. VHF/UHF Multipliers and Bonus Points as indicated under Rules 11 and 12 also apply.

**16 REPEATERS:** Operation through any active repeaters is not allowed for contact purposes, however, the use of such is allowable for the purpose of making contact arrangements. Contacts made using orbiting satellites or EME as a medium are acceptable.

**17 MODES OF OPERATION:** AM, FM, and SSB are both modes of operation. RTTY and CW are both regarded as being CW. It would not be expected that more exotic modes, such as SSTV or Fast Scan television would be used in this contest.

**18 LOG FORMAT:** All logs shall be set out under the following headings and in the order shown: Date; Time UTC; Call Sign; Band; Mode; RST Sent; RST Received; QSO Points; Multiplier; Bonus Points; Total Points Claimed. **NOTE: The last three columns need only be shown where applicable. Contacts must be listed in order of Time and Serial Number. Each log page must also carry a progressive Total Points Score Claimed at the bottom of each sheet.**

Scores Claimed must be calculated by first multiplying the QSO Points Score as taken from

Rule 10 by any applicable multiplier from Rule 11 and then adding any Bonus Points as per Rule 12. **19 SUMMARY SHEET:** A Summary Sheet must be included which indicates the following details: For each contact for which a multiplier is applicable, the Serial Number of the contact and also details of the respective stations locations which apply to the contact. Such details must include either latitude/longitude references for each station or some satisfactory proof by such as map reference or distance calculation as to the distance over which the QSO was conducted. For Bonus Points to be claimed, suitable evidence must be provided as to the method of Natural Power Generation employed. Such evidence could take the form of a photograph of the generating equipment used or a signed statement by another amateur showing his call sign, declaring that he has inspected the generating equipment referred to.

**20 FRONT SHEET:** Each log must be accompanied by a Front Cover Sheet which provides the following information: Name; Address; Call Sign; Division (six or 24 hour); Section (A to J); Number of Contacts; Claimed Score. This sheet must also indicate station location, equipment used, power generating system employed and in the case of Multi-operator Stations, a list of operators names and call signs, together with their signatures. This Front Sheet must also carry a declaration signed by a licensed amateur as follows:

**DECLARATION — I hereby certify that this station was operated in accordance with the rules and spirit of the contest. Signed . . . . . Date.**  
**21 MULTIPLE STATION OPERATION:** In the case of operators who have entered the contest in the six hour Single Operator Section it is allowable for them, upon their return to their Home Station, to make contacts with portable field stations. For this purpose they must submit a separate log which will be regarded as a Check Log only; ie they cannot enter into more than one section of the contest for competitive purposes. Operators who are interested in providing more field day activity are encouraged to adopt this practice where possible. It should be noted however, that the practice of Multi-operator Station participants considering themselves to be portable stations and making contacts with the portable field contest station so as to bolster that station's score is deemed to be not in the spirit of the contest, and as such is not acceptable.

**22 CERTIFICATES AND TROPHY:** Certificates will be awarded to the winner of each section in both the six and 24 hour divisions of the contest. The six hour certificates cannot be won by the 24 hour entrants. The Contest Manager also reserves the right to award other certificates where the effort made by a particular station is of special merit in his/her section.  
**The Highest CW Scorer** outright in the contest, irrespective of the section of the contest entered, will receive a trophy in the form of the **President's Cup** to hold for a period of 12 months. This award is intended as an encouragement to operators to utilise the CW mode whenever possible.

**23 DISQUALIFICATION:** The general Contest Disqualification provisions as outlined on page 2 of Amateur Radio for August 1985, apply to this contest. It is again pointed out that you should read the above rules properly so as to understand them and ensure that your log does comply with the contest rules laid down.

**24 LOG SUBMISSION:** Logs should be forwarded to the Federal Contest Manager, Box 1234, GPO, Adelaide, SA. 5001, as enclosed in a pre-paid envelope should be endorsed **John Moyle Memorial Field Day Contest**. Closing date for entries is 2nd May 1986.

**UBA SSB TROPHY CONTEST**  
 To be held from 0600UTC 22nd to 1800UTC 23rd February 1986.

This annual event is sponsored by the Union of Belgian Amateurs. Participation is dominated by Europeans. Bands 10-80 metres can be used but are divided into the following classes:

a Single operator, 40 and 80 metres only, six hours — two hours on Sunday, 0900 to 1100UTC, other four hours free choice.

b Single operator, 40 and 80, only 12 hours.  
 c Single operator, all bands, only 24 hours.  
 d Multi-operator, all bands, full 36 hours.  
 SWLs — a, b, and c as above.  
**EXCHANGE:** RST and QSO serial number. Belgian stations will include their province abbreviation.  
**POINTS:** ON and QN Forces in Germany, 10 points per contact. QSOs with one of the French countries, one point.

**MULTIPLIER:** Each Belgian province plus a BSD/FBA worked on each band (maximum of 10 per band).

**FINAL SCORE:** Total QSO points times the sum of multipliers for each band.

**AWARDS:** Certificates to the top scorers in each class for each country.

Use a separate sheet for each band and a summary sheet showing the scoring and essential information, including the usual signed declaration.

Mailing deadline is the 1st April 1986, to UBA HF Contest Committee, Galica Jan ON6JG, Oude Gendarmieriestraat 62, B-3100 Heist op den Berg, Belgium.

**RSGB 7MHz CW CONTEST**

To be held from 1200UTC 22nd February to 0900UTC 23rd February 1986 on 7.000 to 7.300MHz.

The rules are the same as those used last year. Only single operator entries will be recognised. The following rules are for stations other than the British Isles:  
**EXCHANGE:** RST plus a three digit QSO number starting with 001.  
**SCORING:** Stations outside Europe score 15 points per contact.

**MULTIPLIER:** One for each different British Isles prefix worked (G2, GC3, GQ4, G6, GJ8, GM3, GQ, GWR, etc), maximum of 49 possible with no credit for GB prefix.

**FINAL SCORE:** Total QSO points times the country prefix multiplier worked.

**AWARDS:** Certificates will be awarded to the first, second, and third place winners in each section.

Include a summary sheet showing the scoring and a list of the country prefixes worked, and the usual signed declaration, and all rules and regulations have been observed.

There is also a SWL section with the scoring the same as above, logging BI stations only. Record the call as well as the serial number sent. The call sign of the station being worked may only be repeated once in every three contacts logged unless it is a new multiplier.

Unmarked duplicate contacts will be penalised at ten times the number claimed. Logs containing in excess of five unmarked duplicates will be automatically disqualified.

Entries must be received by 21st April 1986 and be sent to RSGB HF Contest Committee, PO Box 73, Lichfield, Staff, WS13 6JJ England.

**RTTY JOURNAL CONTEST**

This is the fifth RTTY contest sponsored by the RTTY magazine in conjunction with 73 MAGAZINE and will be held from 0000 to 2400UTC, 22nd February 1986.

Disqualification provisions as outlined on page 2 of Amateur Radio for August 1985 apply to this contest. Single operator stations are limited to 16 hours of operation. Multi-operators may operate for the full 24 hours. Off times must be at least 30 minutes each and must be indicated in your log.  
**CLASSES:** Single operator and multi-operator, single transmitter. Single and all band, 10-80 metres.

**EXCHANGE:** RST and a consecutive QSO number.

**SCORING:** Five points for contacts with Ws and Vs, 10 points for all other contacts. One multiplier point for each US state (48), VE province/territory, and DX country worked on each band.

**FINAL SCORE:** Total QSO points times the sum of the multipliers from each band.

**AWARDS:** Will be issued in each class to the winners in each DX country (minimum of 25 QSOs to be eligible).

**DISQUALIFICATION:** Taking credit for duplicate contacts in excess of two percent of the total, and other discrepancies will be deemed ground for disqualification.

Use a separate log sheet for each band, a dupe and summary sheet, and a multiplier check sheet. Indicate equipment and power used.

Mailing deadline is 22nd March 1986 to The RTTY Journal, 1155 Arden Drive, Encinitas, CA 92024.

#### CQ WW 160 METRE SSB CONTEST

To be held from 2200UTC 21st February to 1600UTC 23rd February 1986.

There are no changes from last year's format for this contest.

**EXCHANGE:** Signal report and QTH (no QSO serial number).

**SCORING:** Contacts with stations within own country count two points; with stations in other countries but the same continent, five points; with stations in other continents, 10 points.

The multiplier remains the same, each US state (48), Canadian areas (13) and DX country (US and Canada are not country multipliers).

Mailing deadline is 31st March 1986 and logs should be sent to Don McClenon N4IN, 3075 Florida Avenue, Melbourne, FL 32904 or 76 N Broadway, Hicksville, NY 11801.

73, Ian VK5QX AR



Further to the Honour Roll, which began on page 57 last month as a result of the Editorial in November magazine.

Ray Kilby VK7RK, is another amateur who has been a member of the Institute for fifty years. Ray borrowed the WIA Badge Block to incorporate it on his QSL card in 1935, and has been a continuous member since that time.

Ray has always held the VK7RK call sign since licensed and has remained in the Launceston area during his amateur days.

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## WE SERVICE WHAT WE SELL

**NATIONAL CO-ORDINATOR**

Graham Ratcliff VK5AGR

**INFORMATION NETS**
**AMSAT AUSTRALIA**

Control: VK5AGR

Amateur Check-In: 0945 UTC Sunday

Bulletin Commences: 1000 UTC

Winter: 3.685MHz — Summer: 7.064MHz

**AMSAT PACIFIC**

Control: JA1ANG

1100 UTC Sunday

14.305MHz

**AMSAT SW PACIFIC**

2200 UTC Saturday

21.260/28.87MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

**ACKNOWLEDGEMENTS**

Contributions for this month have been received from Bob VK3ZBB and Graham VK5AGR. Acknowledgement for the information relating to the UoSAT satellites, which has been gleaned from various UoSAT bulletins is also duly given to the UoSAT team.

**AMSAT-AUSTRALIA NEWSLETTER**

Graham VK5AGR, the National Co-ordinator of AMSAT-Australia is now producing a monthly newsletter containing updated satellite news, orbital predictions, Keplerian data, and operating hints and techniques. The objective of the newsletter is to keep the amateur populous informed on the latest information available, and to realise funds for the funding of projects, or the purchase of an item/s of hardware for a future amateur satellite project; eg Phase-3C, Phase 4, or whatever. The cost of the Newsletter is \$15.00 and cheques made payable to the WIA (SA Division) should be forwarded to Graham VK5AGR, 9 Homer Road, Clarence Park, SA. 5054.

To date, the Newsletter has been a resounding success within Australia, and now comments from overseas amateurs, who have received copies from friends in Australia, indicate that they too would like something similar in their own countries.

The Newsletter is basically an eight page compendium of the nitty-gritties that are relevant in the short-term, items that are basically out of date when printed in this column, due to the six-week lead time of AR. To date, it has included some small computer programs specifically for satellite determination, the latest telemetry blocks from OSCAR-10 and OSCARs-9 and 11. If you are at all interested in satellite communication, this Newsletter is a must.

**HAND-HELD COMPUTER OFFER**

The offer, previously published in the November '85 AMSAT column, is still open. The response to the original offer literally caught AMSAT-Australia by surprise. Consequently, there were some delays in delivery because additional supplies had to be obtained to fulfill the long list of orders.

However, stocks have been replenished and those interested should forward their cheques to Graham VK5AGR, as above.

For those new readers to this column who do not have access to the November issue of Amateur Radio, the offer is for a Sharp PC-1246, complete with software for OSCAR-10, written by Dr Karl Meinzer DJ4ZC. Along with your cheque for \$70.00, made payable to the WIA (SA Division), also include your QTH's Latitude and Longitude so that your computer can be personally programmed by AMSAT-Australia. Hence, when you receive the computer, you simply turn it on, follow the simple instructions, and you will be given beam Azimuth and Elevation headings to OSCAR-10 from your QTH, along with other relevant orbital data.

**OSCAR-10 APOGEEES  
February 1986**

DAY	ORBIT #	APOGEE U.T.C HHMM:SS	SATELLITE CO-ORDINATES		I-----		DEAM HEADINGS-----I		PERTH	
			LAT DEG	LOD DEG	AZ DEG	EL DEG	AD DEG	EL DEG	AZ DEG	EL DEG
1st	February									
32	1984	0140:01	-26	157					111	7
32	1985	1319:32	-26	333	94	38	100		248	6
2nd	February									
33	1986	0859:04	-26	148	99	38	104	19	115	-8
33	1987	1238:35	-26	323					252	14
3rd	February									
34	1988	0810:06	-26	138	183	22	189	11		
34	1989	1157:35	-26	314			247	4	256	22
34	1990	2337:06	-26	129	187	14	113	4		
4th	February									
35	1991	1116:38	-26	384	245	1	251	11	268	38
35	1992	2256:09	-26	128	112	6				
5th	February									
36	1993	1835:48	-26	295	250	9	256	19	264	39
36	1994	2215:11	-26	118	116	-1				
6th	February									
37	1995	0754:48	-26	285	254	16	268	27	268	48
7th	February									
38	1997	0913:43	-26	276	250	24	265	36	274	57
8th	February									
39	1999	0032:45	-26	267	263	33	278	44	281	66
9th	February									
40	2000	0751:45	-26	257	267	41	276	53	294	75
10th	February									
41	2003	0718:48	-26	248	272	58	283	62	338	82
11th	February									
42	2005	0629:58	-26	238	279	59	296	78	42	81
12th	February									
43	2007	0548:58	-26	229	288	68	321	77	78	73
13th	February									
44	2009	0507:53	-26	228	387	76	11	88	81	64
14th	February									
45	2011	0426:55	-26	218	351	81	52	75	88	55
15th	February									
46	2013	0345:55	-26	281	45	78	78	67	93	46
16th	February									
47	2015	0304:58	-26	191	68	78	88	58	97	37
17th	February									
48	2017	0224:01	-26	182	79	61	87	49	181	28
18th	February									
49	2019	0143:08	-26	172	86	52	92	41	185	28
19th	February									
50	2021	0102:03	-26	163	92	44	97	32	189	12
50	2022	1241:34	-26	338					245	2
20th	February									
51	2023	0021:03	-26	154	96	35	102	24	113	4
51	2024	1200:34	-26	329	9				258	9
51	2025	2348:06	-26	144	181	27	186	16	117	-3
21st	February									
52	2026	1119:37	-26	328			244	-8	254	17
52	2027	2259:08	-26	135	105	19	118	9		
22nd	February									
53	2028	1838:39	-26	318	242	-3	249	7	257	25
53	2029	2218:08	-26	125	189	11	115	1		
23rd	February									
54	2030	0957:39	-26	381	247	4	253	14	261	34
54	2031	2137:11	-26	116	114	3				
24th	February									
55	2032	0916:42	-26	291	251	12	257	22	265	42
25th	February									
56	2034	0835:42	-26	282	255	19	262	38	278	51
26th	February									
57	2036	0754:44	-26	272	268	28	266	39	276	68
27th	February									
58	2038	0713:47	-26	263	264	36	272	48	284	78
28th	February									
59	2040	0632:47	-26	254	269	45	278	56	382	78

# OSCAR-10 APOGEE March 1986

DAY	ORBIT #	APOGEE U.T.C. # HHMM:SS	SATELLITE CO-ORDINATES		I-----BEAM HEADINGS-----I								PERTH	
			LAT DEG	LOE DEG	AZ DEG	EL DEG	ABSL DEG	DEL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
1st	March													
68	2842	0551:58	-26	244	274	53	287	65	8	83				
2nd	March													
61	2844	0518:52	-26	235	282	62	303	73	58	78				
3rd	March													
62	2846	0429:52	-26	225	294	71	337	79	76	78				
4th	March													
63	2848	0348:55	-26	216	319	79	31	79	84	68				
5th	March													
64	2850	0307:57	-26	206	15	81	61	72	98	51				
6th	March													
65	2852	0226:57	-26	197	56	75	75	64	95	42				
7th	March													
66	2854	0146:08	-26	188	73	67	83	55	99	34				
8th	March													
67	2856	0105:02	-26	178	82	58	89	46	103	25				
9th	March													
68	2858	0024:02	-26	169	69	49	94	37	106	17				
68	2859	1231:34	-26	164	244	4	117	-1	218	9				
68	2860	0324:05	-26	159	94	48	99	29	110	9				
10th	March													
69	2861	1122:36	-26	335					247	4				
69	2862	2302:07	-26	158	98	32	103	21	115	2				
11th	March													
70	2863	0041:36	-26	325					251	12				
70	2864	2221:07	-26	141	102	23	108	13						
12th	March													
71	2865	1000:39	-26	316					255	28				
71	2866	2148:18	-26	131	107	15	112	6						
13th	March													
72	2867	0919:41	-26	306	244	-8	258	18	259	28				
72	2868	0859:10	-26	122	111	8	117	-1						
14th	March													
73	2869	0038:41	-26	297	249	7	255	17	263	37				
73	2870	2018:12	-26	112	115	1								
15th	March													
74	2871	0757:44	-26	288	253	15	259	25	267	46				
16th	March													
75	2873	0716:46	-26	278	257	23	264	34	272	55				
17th	March													
76	2875	0635:46	-26	269	261	31	269	42	279	64				
18th	March													
77	2877	0554:49	-26	259	266	39	274	51	290	73				
19th	March													
78	2879	0513:51	-26	250	271	48	281	60	318	81				
20th	March													
79	2881	0432:51	-26	240	277	57	292	68	38	82				
21st	March													
80	2883	0351:54	-26	231	286	66	313	76	67	75				
22nd	March													
81	2885	0318:54	-26	222	301	74	359	80	79	66				
23rd	March													
82	2887	0229:56	-26	212	338	88	45	76	87	57				
24th	March													
83	2889	0148:59	-26	203	36	79	67	69	92	48				
25th	March													
84	2891	0100:02	-26	193	64	72	78	68	96	39				
26th	March													
85	2893	0027:02	-26	184	77	63	85	51	100	38				
85	2895	2346:04	-26	175	85	54	91	43	104	22				
27th	March													
86	2897	2355:04	-26	165	98	46	96	34	100	14				
28th	March													
87	2898	1044:35	-26	348					105	-8				
87	2899	2224:07	-26	156	95	37	101	26	112	6				
29th	March													
88	2188	1093:38	-26	331					249	7				
88	2191	2143:09	-26	146	100	20	105	18	116	-1				
30th	March													
89	2182	0922:41	-26	322					243	-2				
89	2183	2102:09	-26	137	104	20	109	18						
31st	March													
90	2184	0041:40	-26	312					248	5				

most errors so as to avoid any serious consequences. The satellite is completely under computer control and any uncorrected software error could be devastating. The system is also designed to count the number of times the error-correcting feature has been used. This count comprises an index to the number of errors incurred.

Several weeks ago, engineers began to notice an increase in the number of hits experienced. It was unclear, at the time, whether they were due to soft errors or one of several types of hard errors. A diagnostic software routine, designed by DJ4ZC, recently confirmed, however, that the errors are hardware-based. The fault has been identified in specific memory locations, Hex 0781 and 3D81. W3GEY points out that it is quite likely the fault lies in adjacent memory cells; adjacent real estate on the silicon memory die, itself. This could be due to either a latent manufacturing defect or the impact of a heavy particle. The area of memory affected is normally allocated to data rather than operating system so the overall prognosis is excellent.

The memory chips, 16K NMOS devices, were modified by AMSAT to reduce radiation susceptibility. The modification included a Tantalum metal slab on the chip and a brass enclosure. Nevertheless, an energetic cosmic ray, or the debris resulting from one can pass through many metres of lead, according to AMSAT.

Identification of a specific failure site by DJ4ZC eliminates several significantly more worrisome possibilities. Indeed, the error correcting methods chosen were designed to accommodate these anticipated, radiation-induced incidents quite well and the system seems to be working.

## AMSAT-OSCAR-10 OPERATIONS

The operating schedule of AO-10 can change at short notice when attitude changes to compensate for approaching eclipses are warranted. In addition to monitoring the AO-10 beacon for early word on any changes, check into the AMSAT-Australia Net each Sunday evening (times are at the head of this column).

In recent weeks, the Net Controller, Graham VK5AGR, has been conducting an auxiliary Sunday net on OSCAR-10, location and schedule permitting, to allow limited licensees to participate in AMSAT-Australia activities. The times of operation for the OSCAR-10 Net are promulgated on the previous weeks nets.

## UOSAT SPACECRAFT OPERATIONS

### DCE MESSAGE SYSTEM VERSION 2

In January 1985, W3AZIA/VE3 and NK6K developed DCE Message System Version 1 software. This software provided a way to use the DCE for the forwarding of short messages. It was rushed to completion and used to demonstrate the PACSAT concept at the Pacific Telecommunications Conference in Hawaii. Now, after two weeks working long hours at the UoS, NK6K and K8KA have written and tested spacecraft and ground-station software for DCE Message System Version 2.

Version 2 will provide a solid foundation for further DCE tests, reliable demonstrations of low-orbit store and forward message systems, and perhaps some "production use" of the DCE to provide long distance amateur radio digital communications. Toward these ends, Version 2 supports several ground-station commands, uses the full 96 kbytes of DCE memory, can handle single messages up to 16 kbytes long, and can be used by either full or half-duplex ground-stations. DCE ground-station software running on the BBC micro-computers at UoS can exercise all of the functions of the DCE, and will provide a basis for ground-station software development on other computers.

Receiving stations, that are not within the satellite footprint of a DCE ground-station, will still be able to monitor DCE activity. When the DCE is idle, it transmits "title frames", and these transmissions will be switched onto the satellite downlink for 30 seconds during every loop through the OBC Diagnostics downlink schedule. (The 30-second window now occurs after the OBC Diagnostics status window, which follows the WOD dump).

DCE title frames, or Tframes, are sent in the

This offer is a service to you, the satellite communicator, by AMSAT-Australia, and a right bargain, at that, if the initial response to the offer has any indication.

## AMSAT-OSCAR-10 IHU MEMORY FAULT

AMSAT engineers have confirmed earlier diagnoses that an AO-10 memory fault has developed. The fault will have no effect on operations or overall spacecraft longevity according to W3GEY.

The fault in the Integrated Housekeeping Unit (IHU) memory appears to have been caused by a heavy particle impact; possibly the debris of an energetic cosmic ray. The IHU memory has been designed to accommodate both soft errors, the kind that are encountered randomly and are one shot events, and so-called hard errors, one which represent a physical change in hardware and are permanent.

The IHU software can not only detect errors when they occur, but can automatically correct for

same format as other DCE frames, as described below, and they contain a message number and the first line of text from the message.

#### GENERAL FORMAT OF DCE FRAMES

DCE frames all share the following format:

<10h> <03h> <cmd> <cmd not> <data length> <data> <crc>

Each byte is sent as an asynchronous character with eight data bits and no parity. Frames are preceded by several STN bytes <16h> for modem synchronisation.

<cmd> — a single ASCII character specifying a DCE command

<cmd not> — the inverse of <cmd>. Can be calculated by <cmd> XOR FFh or by 255 minus <cmd>

<data length> — a single byte giving the length of the <data> portion in bytes. Data length is between 0 and 126 bytes

<data> — <data length> bytes of command data. This data can be either ASCII characters or binary bytes

<crc> — two bytes of cyclic redundancy check. The CRC is a type of checksum, and it covers everything from <cmd> to the end of <data>

#### STUFFING <10h> BYTES

In order to assure that <10h> <03h>, the beginning of frame marker, does not get transmitted in the data field, all <10h> bytes, other than the one at the beginning of a frame are doubled. Repeat: during transmission, <10h> is converted to <10h> <10h>. When receiving a frame, after the first <10h> <03h> has been detected, all <10h> <10h> sequences should be converted to a single <10h>.

#### CONTENTS OF A TITLE FRAME

The <cmd> in a title frame is 'T'. The contents of the <data> portion of a title frame are as follows:

Message number, 1 byte. If the first bit of this byte is set, the message is not complete, and the message title may be invalid.

Message length, 1 byte. This is the length of the message that is stored on the DCE. It is not the length of this title frame.

Multiply by 64 to get the message length in bytes.

Call sign of the station using DCE, nine bytes of ASCII. If no one is using DCE, then this will be nine blanks.

Title of the message, the remaining <length> minus 11 bytes of the <data> field. This is the first line from the message stored in the DCE. The length referred to above is the FRAME LENGTH, which follows the inverted command. We subtract 11 from it to account for the message number, message length and call sign data.

When you decode title blocks, you will find that the title with message number 0 contains interesting information on the status of the DCE. Good luck, Jeff G0/K8KA.

#### COMPUTER PROGRAMS

A recent addition to the AMSAT-Australia software library is a tracking program designed to run on the AMSTRAD. This program is based on the Commodore Program AMS-2064. For information, please forward an SASE to Graham VK5AGR, requesting details.

#### PHASE 3-D FUNDING

Most readers of this column would be aware that the objective of the AMSAT-Australia Newsletter is to provide an avenue of raising funds for a future space project. Similarly, those people who utilise the Software Service and in appreciation make a donation for that service, are also providing funds towards that space project. Over the last 12 months, an amount of money has been gradually accumulating towards the objective that Graham VK5AGR first envisaged when he instigated the Newsletter.

Therefore, following discussions with Karl DJ4ZC, on the status of Phase-3D, Graham is intending to pass a percentage of the proceeds to AMSAT-UK as an initial donation, for an item of hardware for Phase-3D. As yet, it is unknown what area this donation will specifically fund, however it is hoped that with continued support for the Newsletter, and donations for the service provided

### SATELLITE ACTIVITY FOR PERIOD 31 AUGUST TO 30 SEPTEMBER 1985.

#### 1. LAUNCHES.

The following Launching Announcements have been received:-

1985-079A	Cosmos 1680	Sept 4	USSR
1985-080A	Cosmos 1681	Sept 6	USSR
1985-081A	Soyuz T-14	Sept 17	USSR
1985-082A	Cosmos 1682	Sept 19	USSR
1985-083A	Cosmos 1683	Sept 19	USSR
1985-084A	Cosmos 1684	Sept 24	USSR
1985-085A	Cosmos 1685	Sept 27	USSR
1985-086A	Cosmos 1686	Sept 27	USSR
1985-087A	Intelsat VA F-12	Sept 29	ITSO
1985-888A	Cosmos 1687	Sept 30	USSR

#### 2. RETURNS.

During the period thirty five objects decayed or returned including the following satellites:-

1983-091A	Cosmos 1494	Sept 26
1985-043A	Soyuz T-13	Sept 26
1985-068A	Cosmos 1673	Sept 19
1985-076A	STS 511	Sept 3
1985-077A	Cosmos 1678	Sept 12
1985-080A	Cosmos 1681	Sept 19

#### 3. GENERAL.

As at Sept 9, 1985, 1047UT; 1966-100A ATS 1 was reported at 121.600°West, Inclination 11.808°.

### SATELLITE ACTIVITY FOR PERIOD 1 OCTOBER TO 30 OCTOBER 1985.

#### 1. LAUNCHES.

The following Launching Announcements have been received:-

1985-089A	(16107)	Cosmos 1688	Oct 2	USSR
090A	(16110)	Cosmos 1689	Oct 3	USSR
091A	(16112)	Molniya 3-26	Oct 3	USSR
092A	(16115)	STS-51J	Oct 3	USA
092B	(16116)	USA-11	Oct 3	USA
092C	(16117)	USA-12	Oct 3	USA
093A	(16129)	USA-10	Oct 9	USA
094A	(16138)	Cosmos 1690	Oct 9	USSR
094B	(16139)	Cosmos 1691	Oct 9	USSR
094C	(16140)	Cosmos 1692	Oct 9	USSR
094D	(16141)	Cosmos 1693	Oct 9	USSR
094E	(16142)	Cosmos 1694	Oct 9	USSR
094F	(16143)	Cosmos 1695	Oct 9	USSR
095A	(16169)	Cosmos 1696	Oct 16	USSR
096A	(16177)	PRC-17	Oct 21	China
097A	(16181)	Cosmos 1697	Oct 22	USSR
098A	(16183)	Cosmos 1698	Oct 22	USSR
099A	(16187)	Molniya 1-65	Oct 23	USSR
100A	(16191)	Meteor 3	Oct 24	USSR
101A	(16198)	Cosmos 1699	Oct 25	USSR
102A	(16199)	Cosmos 1700	Oct 25	USSR
103A	(16220)	Molniya 1-66	Oct 28	USSR
104A	(16230)	STS-61A	Oct 30	USA
104B	(16231)	Glorr	Oct 30	USA
*010B	(15543)	USA-8	Jan 24	USA

#### Notes:

- \* 85-010A USA-8 was omitted from earlier lists. The satellite was placed in geosynchronous orbit.

85-092A STS-51J was crewed by K.J. Bobko, R.J. Grabe, D.C. Hiler, R.L. Stewart and W.A. Pailles. Payload included two Defense Satellite Communication Systems.

85-104A STS-61A was crewed by H.W. Hartsfield, S.R. Nagel, B.J. Dunbar, J.F. Buchli, G.S. Bluford, E. Messerschmid, R. Furrer and W. Ockels. Amateur Radio was carried on this mission.

85-104B Glomr is a Global Low Orbiting Message Relay.

#### 2. RETURNS.

During the period 45 objects decayed or returned including seven satellites.



## Thumbnail Sketches

Peter Brown VK4PJ

16 Bede Street, Balmoral, Qld. 4171



#### HAROLD BREMERMAN VK4HB

Harold was particularly well-known as the popular station manager of VK4WIA for many years. He was also Secretary and Foundation Member of the Brisbane DX Club, and he also served on the VK4 Council.

For these activities and other support of the WIA, Harold was awarded Life Membership of the VK4 Division.

By profession he was an engineer, and was holder of a City and Guilds Certificate, and Life Member of the IREE. Harold was also skilful with tools and instruments and his technical knowledge and administrative ability made him an asset to amateur radio.

Born in London in 1903, Harold obtained his First Class Radio Certificate in 1918. He moved to Australia in 1927.

Television interested him and he constructed a "Nipkow" disc which he declared redundant after a visit to England in 1936, where he saw the trend.

Harold retired about 20 years ago, but still retains an interest in Lodge work. Blondie, a familiar figure with Harold at earlier Conventions leads a quiet life these days.

AR

#### JOHN ATKINSON VK4RZ (ex VK2RZ, ex ZL1RT)

John was born at Blackburn, in the United Kingdom, in 1906, and came to Australia in 1912. Both coming to Australia, and becoming a radio amateur, were by chance.

The TITANIC to USA and Canada was more



expensive than the slower AFRIC to Australia, so to Australia the family came, only to learn that the TITANIC had sunk, but that many had been saved by use of the ship's radio.

Not long afterwards John, near Pennant Hills Radio, obtained access to a Ford coil and battery and transmitted a radio signal while receiving via a piece of lead across two 'Gem' razor blades. Twelve-year-old John, and a mate, with an intercom across the street, also constructed a more sophisticated transmitter and receiver and were able to listen to Chas McCluran, the only 'B' class station with a call sign in Sydney.

Penurious John successfully applied for, and obtained, a messenger boy post with Sid Colville, ex XCF, and Moore's Radio Shop. Remuneration was 10/- and transport from Parramatta was two shillings which left eight shillings to 'keep the home fires burning'.

John was with C & M for two periods and became friendly with 'many-of-note', including Sir Isaac Isaacs who was very proud of his library. Apart from selling receivers, C & M supplied basics for broadcast stations and John, as VK2RZ, remembers Cliff VK4CG, obtaining parts for 4GR Toowoomba.

During 1926-28, John, with Sid as leader, operated the first equipment installed in an

by the Software Library, will allow AMSAT-Australia to make further donations towards Phase-3D and other future satellite projects and programs.

de Colin VK5HI  
AR

#### CAUTION, IT MAY BE LETHAL

A letter from John Wilkinson VK6ZJJ, points out that advice in the article in December's magazine, page 28, which was reprinted from RADCOM July 1982, on the subject of PCBs may be hazardous.

John provided a copy of an article in HAM RADIO, December 1983 — which stated that low temperature burning of PCBs can produce DIOXIN, the most poisonous and deadly substance that the human race has created. The HAM RADIO article is authoritative and rather frightening.

**Do not attempt a flame test for PCBs unless you fully understand their chemistry and have correct safety equipment.**

aircraft — both were members of the Aero Club. They used a battery receiver and a small prop driven 250V generator for transmitting. There was no long distance reception due to lack of shielding.

John helped Wally VK2SA fit Sydney police equipment in a van. The equipment was mounted in the prisoners area and the first offender caught, when told of how the radio had assisted in his capture, put his boot through all the unprotected tubes.

John opened his own business in New Zealand and operated with the call sign ZL1RT. Later he moved to Grafton, Queensland, and finally to the Gold Coast where his present house was built to cater for amateur radio, with his 'shack' perched some 12 metres above ground and also above the main roof.

The first SSB DXpedition to Tonga was carried out by John, who 'kept log' whilst three Tongans filled out QSL cards.

John, who has been retired for many years, and Joan, who is about to retire, are enjoying good health and we look forward to hearing John on the bands for many more years.

AR





# Australian Ladies Amateur Radio Association

Joy Collis VK2EBX  
PUBLICITY OFFICER, ALARA  
Box 22, Yeoval, NSW 2868



Marlene VK5QO and Bev VK6DE, ALARA Editor and Librarian respectively when the photograph was taken in August 1985.

## ALARA CONTEST

Well, I for one "had a ball", finally emerging from the shack somewhat dazed, bleary-eyed, and



FROM LEFT: Ian, Len VK2LM, Betty VK2AMU, Dorothy VK2DOB, John VK2ZOI holding Roger. FRONT: Peter.

gravel-throated, clutching a sheaf of papers in my hot little hand. I was greeted by the male members of the household with sighs of relief, and such remarks as "At last!" and "What time's dinner?"

Though 10 and 15 metres were almost a write-off, (I only managed three contacts on 15, and none at all on 10) conditions on the lower bands, particularly 80 metres, were a decided improvement on 1984.

We were most appreciative of the many menfolk who joined us in making this fifth contest the best yet, sparing no effort to give us valuable contacts, and those unsung heroes — the OMs (mine among them) who minded the children, cooked

the meals, washed dishes, and made frequent cuppas so that we could participate to the fullest.

The Contest was run along the usual friendly lines, and a good time was had by all.

There were two disappointing aspects: the scarcity of DX contacts, no doubt due to lack of propagation. Very few were heard, apart from some of the ZLs

and the lack of novice YLs on CW for the Mrs McKenzie Trophy. One OM, in particular, hunted through the bands looking for novice YLs to whom he could give a CW contact, without success.

Hopefully we will have the results by next month's issue of Amateur Radio. Marlene VK2KFO, has been burning the midnight oil to get them ready. She reports that logs started arriving on the 13th November, the first three being from OMs, V15GZ, VK2CDB and VK4BRZ respectively.

By 1st December, 22 logs had been received — 13 from ALARA members and nine from OMs, another pointer to the keenness of the male participants. Once again — thanks to the OMs for participating.

## NEW MEMBERS

Welcome to two new members, namely Nancy VK2NPG, who joined on 7th November 1985, and Betty KASONE, who joined on 20th November and was sponsored by VK4JFA.

## WIA 75th ANNIVERSARY

Two ALARA members, Mavis V13KS and Mavis VK3BIR were present as official ALARA representatives at the WIA 75th Anniversary Dinner. Both reported that the event was a great success, and was enjoyed by all.

Until next month, 73/33 Joy VK2EBX.

AR



# WICEN News

On Saturday, 14th December 1985, the Central Coast WICEN was activated to take part in a search of the coastline near Avoca, for a fisherman who was washed into the sea the previous night.

Three walking parties set out, accompanied by WICEN operators who were equipped with two metre hand-held units and communication was provided between the search areas and the Police Command point on a nearby high point, about 1.5km from the coast. One operator was able to communicate on most occasions using only low power (about 100mW) yet the Police and VRA low band portables running around one watt were generally unreliable over the same path. (Perhaps two metres and probably high band (148-174MHz) signals are more readily propagated in the type of terrain encountered than those at low band (70-85MHz)).

The search was scaled down after land, sea and air searches failed to find any trace of the missing person.

Operators taking part were VK2s TV, BJC, ZCO; DBC and TS.

Central Coast WICEN was again activated on 21st December by the Wyong SES Controller.

A fire in 22 000, 44 gallon drums of inflammable liquids (paint, nail polish, Araldite, silicon rubber, thinners, etc) produced a pall of thick black smoke which was causing concern to the authorities. WICEN operators kept a watch on the movement of the smoke and reported back to the Operations Centre using two metres FM. Most traffic was on the WICEN simplex frequency of 145.700MHz, but the Gosford Repeater was also used for a short time.

Operators who offered their services for this operation were VK2s TV, BUQ, ZCZ, ZCO, DET, TS, DBC, KAL, YFF and BJC.

Condensed from SMOKE SIGNALS Volume 14 Number 9  
AR

## EARTHQUAKE APPEAL

At the conclusion of a three-hour concert at the Sydney Opera House, to aid the Mexican Earthquake Victims, the Ambassador for Mexico, HE Dr Jesus F Demene V, honoured Australian radio amateurs by presenting a plaque to Sam Voron VK2BVS. Also on stage with Sam were Ken Gallagar, Fred Greening VK2DZL and Martin Lansdown VK2PJW.



# KNOW YOUR SECOND HAND EQUIPMENT

This month will be our last look at Yaesu for the present time. There are still several early models to look at, but these are not very common and, of course, there are many newer pieces, which are probably well-known.

We will look at them in due course, but for this issue we will look at the FT-101 in its various forms. Without a doubt, this was the most famous series of transceivers ever produced, with the first 101 being introduced to the Australian market in late 1971. It was a much improved version of the FTDX-100, which was covered a few months ago in this column.

As all FT-101 transceivers had similar specifications, we will look at the common features first, and then check on the changes that took place as the series evolved.

The FT-101 was, in the first instance, an 80 to 10 metre transceiver, with operation on USB, LSB, CW, and AM. It was a self-contained unit with AC operation from 100 to 234 volts, and portable or mobile operation from 12 volts DC. Each band had 500kHz coverage and the 10 metre band used four positions of the band switch. Operation from 27.000 to 27.500MHz, 11 metre operation, was provided on all but the last of the FT-101E series.

All wanted facilities were included and these included VOX, Crystal Calibration, 1kHz Dial Calibration, Noise Blanker, and provision for an optional X filter.

The circuit was all solid-state, except for the transmitter final stages which employed a 12BY7 driver and two 6JS6s in the final. The receiver circuitry was changed from time to time with the noise blanker getting quite an amount of attention. Receiver front-end-overload was always a problem with the 101s and as it later evolved, the problem was in the IF section. Many band versions were published over the years, some good and some not so good. At the conclusion of this article several that were published in AR are itemised.

The first 101 can be identified by the two position MOX/PTT-VOX switch. Later models had a three position switch here for MOX/PTT/VOX. Early models are usually considered to be serial number 25000 and under, but there are at least



two versions that come into this category. In Australia, the latter models or the early series became known as the series two. These had the 160 metre band included as a standard feature. Also an improved noise blanker and a final stage cooling fan. One quick way of identifying the early models is the colour of the front panel surround. This was silver until the introduction of the 101B, when it was changed to light grey.

The 101B arrived on the market around August 1974. The 'B' had an upgraded SSB filter and further improvements to the noise blanker.

The first 101E arrived in June 1975. There were two improvements in this model. Firstly, an RF speech processor was included and the front panel side switches were replaced with easier to use toggle-switches. The original RF processor proved to be rather hard to use, as there was no front panel adjustment. As the drive requirements changed from band to band, so it was necessary to dive into the chassis to alter the preset control.

The second series 101E overcame this problem by providing a processor level control, concentric with the clarifier knob. Improvements were also made to the processor itself, which gave better clipping action with lower distortion.

The final model of the 101E was the same in all respects except that the 11 metre band was removed. In the USA this unit was known as the FT-101F.

Yaesu made quite changes to the noise blanker in the 'E' series that did not please all customers.

# A Series to Help You Identify Amateur Equipment

Ron Fisher VK3OM,  
3 Fairview Avenue, Glen Waverley, Vic. 3150



The local Yaesu agent did a brisk trade selling 101B blankers to install in the deficient 101Es.

There were two economy versions of the 101E, the 101EE, which omitted the RF speech processor, and the 101EX that did not have the 12 volt DC supply or the RF speech processor. Both models are quite rare, but watch for them when buying second-hand units, so you don't get caught. They will bring a somewhat lower price.

FT-101 transceivers were sold over a period of several years, but there was only a relatively small variation of price. The first were advertised for \$675 and \$640 by two different advertisers, but the 101B actually dropped to \$579, while the 101E was \$700.

Second-hand value is dependant on condition. There are some very rough examples around, however, in good condition without too much paint damage, I would suggest the following prices as a guideline.

Early 101 (no 160m) \$275. Later 101 (with 160m) \$300. 101B \$325. 101E around \$350. 101E, later version 375. Beware of sets that have been modified and have no written information about what the modifications were. If things go wrong you could be in trouble.

Here are a few 101 articles which appeared in AR: FT-101 Review - February 1974; FT-101 Modifications - August 1973, September 1973, June 1973, March 1974, November 1974, September 1975, October 1975, May 1975, March 1975, December 1975.

## ESTABLISHMENT OF THE CENTRE FOR TELECOMMUNICATIONS DEVELOPMENT

Following the decision of the ITU Administrative Council to establish a Centre for Telecommunications Development within the framework of the Union in Geneva, the Advisory Board of the Centre held its first constitutional meeting at ITU Headquarters from 21-23rd November 1985.

The Board, which will assure the overall direction of the Centre, comprises 21 members, including the ITU Secretary-General as Senior Vice-Chairman (ex officio), the remaining 20 members being personalities drawn from different regions and interests - resource providers and beneficiaries.

The idea of the establishment of a Centre for Telecommunications Development was conceived by the Independent Commission for World-Wide Telecommunications Development and was endorsed by the World Telecommunications Development Conference held in Arusha, Tanzania, during May 1985. The Commission had concluded indeed that in its view "the scope of assistance (to developing countries) has to be expanded and the machinery for providing it rationalised if the scale of improvement that is needed is to be achieved". The Commission went on to say "that to make this assistance effective the arrangements through which it is provided need to be revised and strengthened".

The ITU Administrative Council at its 40th Session in July 1985, endorsed the general thrust of the conclusions and recommendations of the Commission's Report, and decided accordingly to establish the Centre.

## NOW AVAILABLE

**The Historical Cassette which was mentioned in previous WIA 75th Anniversary News Columns, is now available to members.**

THE SOUNDS OF AMATEUR RADIO contains authentic recordings of Marconi; Spark Equipment; Call Signs; Homemade Equipment; Aerials; Early Valve Receivers; The Lead Up to the 1923 Trans-Pacific Tests; The Emergence of Voice Transmissions Early Broadcasts; Amateur Broadcasting; WIA Sunday Broadcasts; A Glimpse at Emergency Communications; A Minister For Defence Speaks on Amateur Radio and is superbly produced by Peter Wolfenden VK3KAU; Max Hull VK3ZS; Kevin Duff VK3CV and Chris Long

### VOLUME ONE —THE SOUNDS OF AMATEUR RADIO—

AN AUSTRALIAN ANTHOLOGY  
FEATURING EXPERIMENTERS TALKING OF  
THEIR OWN EXPERIENCE - INCLUDING  
ACTUALITY RECORDINGS

FROM THE DAYS OF MARCONI  
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# Pounding Brass

Marshall Emm VK5FN  
Box 389, Adelaide, SA. 5001

## KEYS AND KEYSERS (Part II)

Last month we talked about straight and mechanical keys and the 'manual keyer'. Let us continue with electronic keyers and paddles. The simplest electronic keyers rely on a single paddle to drive them. When it is swung to one side, a series of dots is generated; dashes result from a swing to the other side. This sort of paddle is called a *dash key*, after the dash key.

The length of time the paddle is held over determines the number of dots or dashes generated.

The iambic keyer represents the state of the art at the present time. Any number of bells, bells and whistles are available, but as a keying method, iambic is of tremendous significance. The keyer is actuated by separate dot and dash paddles, but when both paddles are held over at the same time, the iambic keyer generates a pattern of alternating dots and dashes. That is where the name iambic comes from. It is a term used in poetry to describe a 'meter', or rhythm consisting of a pair of syllables, the second of which is stressed. For the record, it is worth noting that a meter with the first syllable stressed, it is dactylic, and an iambic keyer sends dactylic if the dash lever is actuated in advance of the dot lever! With a view toward making this all clearer, here is an example of an iambic meter: "In days of old, when knights were bold..." A technique, called scansion, is used to analyse the meter, and the line breaks up like this: In *DAYS* / of *OLD* / when *KNIGHTS* / were *BOLD*... The rhythm is often described as "de dum de dum de dum de dum", or by extension, *dih dah dih dah dih dah dih dah... get it?*

To send SK with a hand key requires 12 separate up and down movements. To send it iambically, the dot paddle is held over and the dash paddle is held over at the end... for a grand total of four movements:

- 1 — press dot      2 — press dash      3 — release dot      4 — release dash.

It sounds complicated, but the fewer the required movements, the easier the keying becomes. Great

speeds are possible once you get the hang of it. Most people start off using an iambic keyer non-ambically (they depress one paddle at a time and don't use the combination available with a squeeze), and then find their way into iambic keying, as time goes by.

An iambic keyer is driven by dual paddles, and there are various ways to go about engineering them. The simplest method consists of two paddles which are held by a spring tension so that they can be swung inwards, against a common centre post. This principle is used in paddles such as the HK1, which is used external to the keyer, and the same principle is used in less rugged paddles which are often used where paddles are built into the keyer.

More esoteric, but a delight to use, is the Benchner paddle. Each of the two paddles has its own post, so the contacts meet flush, rather than a flat contact meeting a round centre post, and they are capable of very fine adjustment.

The Benchner is not cheap, but then again, it is not a lot more expensive than the others, and you get what you pay for.

As far as the keyer itself is concerned, the best introduction is to build one. There are Heathkit kits, but a less expensive alternative is based on the kit marketed by a local electronics firm, some years ago. It originated with WB4VVF in QST, and was later published in Electronics Australia. Unfortunately, the kit, as such, is no longer available, but you should be able to find the circuit board, the Galbraith paddle (GK1) and, I presume, the instructions. The ICs and other components are readily available. In the original design the paddle was built into the keyer. I prefer a separate paddle, so I put all the controls on the front panel, and jacks for all the externals on the back. I modified the design to use a plug-pack for power, and put in a switch for speed control, rather than a pot, so selected speeds could be set quickly. It was also simple to add a rectifier circuit, so the keyer can be driven by a cassette recorder — an alternative, which seemed easier than building a memory for it. The paddle would be, by far, the most expensive part — other than that the whole

thing should cost less than \$20, plus a few hours to construct it.

If you are thinking of buying a keyer, ready-made, there are dozens on the market to choose from. The basic iambic keyer circuitry has been reduced to one IC now, the Curtis 8044, and there is a Vibroplex paddle, with a complete keyer built into the base! There is another, the name of which could be misconstrued, which has the keyer attached to a Benchner paddle.

Beyond the basic keyer circuit, which gives you dot and dash memory, automatic spaces, and a variable speed and weight, the main attraction of more advanced keyers is memory. A memory is very handy during ordinary operations, but for contesting, it is almost mandatory. In choosing a memory keyer, you need to work out the size of the messages to be stored, and the ease of storing, editing, and using them.

Perhaps, the most advanced line of keyers on the market today is produced by Advanced Electronic Applications, of Lynwood, WA in the USA. Their top-of-the-line "Morsomatic MM2" keyer has to be seen to be believed. Featuring two microcomputers, the MM2 will act as a contest keyer, automatically generating serial numbers, as a word generator, sending a programmed message if programmed intervals, and as a trainer, in addition to ordinary keyer functions. In trainer mode, the MM2 can be programmed to start at any speed between two and 98 WPM, and, after an elapsed time of 0.1 to 59.9 minutes, it will have increased to any higher speed between two and 98 WPM. It will generate numbers, characters, or words, but if you want to check progress, you can select one of ten starting positions for use with the Answer Book.

The AEA range also offers keyers with fewer of the MM2's features, such as the CK2 contest keyer, and the KT2 keyer/trainer. The "2" in the name represents the second version of the keyers, in that G4C5 circuitry for lower power consumption and longer memory. The "1" series have most of the features of the newer line, but are less expensive, if you can still find them.

AR



# Spotlight on SWling

Conditions on the higher frequencies have markedly improved lately, especially after our local sunset. The 21MHz band, in particular, has improved with many European signals coming through reasonably well. Signal levels are not a good as they were last summer, but that is only to be expected at the Sunspot Minima.

As well, we have found that the lower frequencies are plagued by static and noise from all the summer storms we have been having.

## E OPENINGS

I did notice several good Sporadic-E openings around the Summer Solstice. One went as high as 144MHz and some local VK7s took advantage of it to work ZLs on 144.100MHz SSB and even reportedly got some to come up on the local FM repeater, which certainly stirred things up a bit. There have been strong signals on the 10 and 15 metre amateur bands, particularly from NSW and SA. I also checked the 27MHz CB calling channel, which was bedlam with so many calling at the one time. It usually is comparatively inactive, locally.

Another indicator of good Sporadic-E are signals from the Radio Australia sites at Shepparton and Lyndhurst. These sound as good as a local MW station when Sporadic-E is present. In fact, several RA harmonics were heard, but these are well down and within limits. I have used RA for

many years as a beacon for Sporadic-E.

## CLANDESTINE OPERATIONS

Recently I received a QSL card from a clandestine station that I heard in 1984. The station took 19 months to reply, but was very good. The card was sent to a Miami, Florida address I had been given. The station gave the call of "La Voz del Cid" — *Cuba Independiente y Democrática* — and broadcast popular music which was interspersed with slogans. This station has been around for a number of years, buying air-time over various Latin commercial stations. However, they were certainly using a clandestine operation for they

## NEW TALKBACK TIME

By the time we are reading this, these openings will have diminished and the propagation will have altered. By now, propagation to North and South America should have improved on 15 and 20 metres. The higher frequencies should start to drop off and LP signals from Europe should be coming earlier. I find that the propagational forecasts, prepared by Mike Bird for both Radio Australia's "Talkback" and "Media Network" over Radio Netherlands, are extremely valuable. They are easily understandable to the beginner or to those further advanced. Incidentally, Radio Australia's "Talkback" is now aired at 1610UTC on Fridays and is repeated at 0310, 0810, or 1230UTC Saturdays over the usual RA channels.

were on 10.041MHz, well within the HF aviation allocations.

I thought that the station had rejected my report, as it was in English. I was aware that other listeners had obtained QSL cards for Spanish reports, which incidentally were sent to Central America. I was surprised that my report was 19 months later, but from Costa Rica. It came in a plain air mail envelope, minus any identification or return address. Inside there was a colourful card, with the CID logo and the basic details. On the reverse side were details of other CID transmissions. There was no identification of the transmitter site, although various theories have been advanced, the common being either in Central America or within the USA.

I haven't heard it lately as it has been absent from 10MHz for about 12 months. I did hear it faintly earlier in the year, in the middle of the crowded maritime allocation on 6.300MHz. I presume they are still using various Latin commercial outlets. Yet now there has been an official "Clandestine" — Radio Marti with identical programming and target audience, utilising VOA facilities. Perhaps this is why "La Voz del Cid" is not heard often these days.

Well, that is all for this month. Until next time, the very best of 73 and good listening — Robin VK7RH.

AR



# Listening Around

Joe Baker VK2BJX  
Box 2121, Mildura, Vic. 3500

Today I sat in front of my trusty typewriter, with a blank piece of paper and wondered just what I would have about this month. I think everyone who has ever attempted to put an article together has had this experience, and I am no exception. If I were a more methodical person, which I am not, I would have my thoughts in order before I start hitting the keys.

Whilst watching television recently, a flautist appeared on-screen playing a most delightful tune. As I watched, my mind was drawn back to earlier days and another flautist, Army Signaller Col Evans, playing Carnival in Venice. This was the first concert held for about 600 troops who had just arrived at the 67 mile post in the Northern Territory, after a tortuous two weeks trip from Strathfield, Sydney.

I will remember this concert — the first real-time concert, under starlit skies with the smell of citronella and the buzz of mosquitoes — not only for the fact that there were no enemy bombers flying overhead, but, during Col's rendition of Carnival in Venice, a large number of mailbags arrived with welcome news from loved ones. (The last I heard of Col was many years ago when he was a member of the ABC Orchestra).

Previously, I have written of other experiences in the Northern Territory, during the war, and I am always intrigued with news from that area. Not so long ago, whilst listening to Radio Australia, the medium wave relay for Darwin, Tennant Creek,

and Alice Springs, I heard that Tennant Creek and Alice Springs are competing with each other to see which town can entice the most tourists to see Halley's Comet, in Central Australia. I also read that Bill Peach, of television fame, is taking a party to the same area to view Halley.

After the Northern Territory, I was stationed at Morotai Island, in the then Netherlands East Indies, and I would now like to write of my experiences there.

After some refresher courses, vaccinations, etc I eventually found myself at a Brisbane wharf for the journey north in the **FREDERICK C AINSWORTH**, a formidable looking warship from the United States of America. Once on board we were issued with live ammunition as we were to sail through enemy infested waters.

Firstly, we were kept below decks, but as soon as we had cleared the Brisbane River and were in the open sea we were allowed to see sunlight once again. We didn't know where we were destined for but by observing which way the sun rose and set, and the approximate speed of the ship, it was possible to assume a rough estimate of where we were located, from day to day.

The **FREDERICK C AINSWORTH** headed through the Coral Sea towards Milne Bay, and it was whilst on this leg of the journey that I engaged the wrath of the Military Police. In the Coral Sea area, at intervals of about half an hour we saw two ships stuck-fast and abandoned on the coral. They had been there so long that it was possible to see right through the gaping holes in their sides. I

promptly went off to my bunk and returned with my camera — a forbidden article on a troop-ship like the **FREDERICK C AINSWORTH**.

I had taken a couple of photographs when suddenly I felt a strong arm on my shoulder, and I was spun around to face a military police sergeant who had caught me 'red-handed'. He demanded I hand my camera over to him, but I refused as there was still some unexposed film in the camera and film was difficult to come by. I was then forced to accompany him for a visit with the military captain who was in charge of the ship.

He ordered me to hand the camera over to him and he duly tore the film up and confiscated the camera until we arrived at our destination. He then said, "I understand you have a radio aboard, also". (Now, I thought no one on board knew I had parts for a battery-operated radio at the very end of my kibitzing). "Yes, I do have the parts of a radio which I was building at Bonegilla Camp, but it is not all put together yet and cannot be operated". The fact that it was not operational made no difference to him and I was sent to retrieve the equipment and hand it over to the captain who would return it to me upon arrival at our destination.

Before throwing him a final salute I attempted to find out how he knew of my radio parts, but he became quite livid and dismissed me.

Next time I will continue my story of life on the **FREDERICK C AINSWORTH** and arrival on Morotai Island.

73 till then, Joe.

AR



## Intruder Watch

Bill Martin VK2COP  
FEDERAL INTRUDER WATCH CO-ORDINATOR  
33 Somerville Road, Hornsby Heights, NSW 2077

February already! It is amazing how the time goes by.

VK intruder reporters will be pleased to hear some news from Bob ZL1BAD. At a conference held in New Zealand late last year, the Indonesian representatives have extracted a promise from their administration to shift the station on 7.098MHz. This will allow amateur operators a little more elbow-room in their section of the 40 metre band.

### WILL THIS MOVE

The US State Department has sent another complaint to the USSR, re the naval intruder, UMS, and we wait to see if this complaint has any effect, bearing in mind that the USSR has already promised to have the station QSY.

### NEW CO-ORDINATOR

The JARL has appointed a new Monitoring Service Co-ordinator. He is Fujio Yamashita JS1UKR. We wish him well, and hope he can inspire the JAs to increase the number of intruder reports from Japan, which is, of course, in IARU Region 3, as Australia is.

### JAMMING

Radio Peking, on 7.035MHz, has been suffering a lot of jamming. I wonder who could be doing that? Radio Tirana, Albania, often suffers the same fate. The point being, of course, that the jamming

stations increase the QRM to amateur operators on the band.

Anyone with RTTY facilities might like to let me know what the signals are on 7.001MHz most nights before 1300UTC.

### RESIDENT INTRUDER

At the time of writing, the nuisance intruder on 14.032MHz seems to have taken up residency there, and I would appreciate any information on that one. He uses FAX and some RTTY, with continuous Morse 'dahs' whilst he is keeping the frequency reserved.

### NOVEMBER STATISTICS

The statistics for last November are as follows:

Broadcast intruders — 417; CW intruders — 117; RTTY intruders — 85; other modes — 65; and 80 intruders identified.

Thanks to VKs — 2KPI, 2PS, 3AMD, 3XB, 3XU, 4AKX, 4BG, 4BHJ, 4BN, 4BTW, 4KAL, 4KHZ, 4MR, 4BUJ, 5GZ, 5TL, 7DO, 7RH and Mr A Bradford for supplying reports of intruders for November. Don't forget to let us know if you hear anything that sounds like a taxi-car operation coming from Asia on the 10 metre band. This may turn out to be a real problem.

See you next month, and I wish you good DX.

AR

## EDUCATION AND EXAMINATIONS

As a result of a recent meeting with the Department of Communications, to discuss education matters, one or two points require some feedback to assist the Federal Education Officer. The Federal Education Officer would like to hear from candidates who have, since May 1984, sat for both AOCOP and NAOCOP theory on the same day. The DOC is surveying results of those people to compare the marks obtained. What the FEO would like to hear is comments from candidates who have sat both papers on the same day, as to the relative standards of the papers from the candidate's point of view.

A further question raised by the Department was the Novice Certificate and Licence. How do holders of this qualification feel by being called "Novices"? Do Novice operators consider the term derogatory in any way? Your thoughts on this matter would be appreciated.

The third and final question on which feedback is requested, is the idea of a single examination paper for both levels with different pass marks. In view of the new examination fees, this could be a factor that needs consideration. Suggestion is that we have used for two sections on the one paper, an optional extra section or a single paper with certain questions that need to be answered correctly to obtain AOCOP.

It is important though, that the difference between the two levels is maintained.

By putting these three questions to members it should be possible to get the views of expecting members to make decisions for us. This is not so, we are seriously seeking the opinions of members to assist in the formulation of policy.

### REVISED EXAMINATION SYLLABUS

The syllabus, in leaflet form, has been reprinted by the Department of Communications and is now available. It is suggested that classes commencing in the New Year work to this syllabus.

Any feedback or questions about education should be directed to the Federal Education Officer, Brenda Edmonds VK3KT, QTHR.

## THEY WERE AROUND THEN TOO!

Pirates were apparently rife in 1925, as the following excerpt from The Listener in, 12th September 1925 states:

"The Northcote and District Section of the

WIA wishes to warn the pirate who is operating a spark set in this district that every member will do his best to locate him and notify the authorities.

One of the members has offered his car and a loop aerial will be used to find this nuisance. This Club will do its utmost to eliminate these pirates"

Wonder if they caught him, eventually!

# Club Corner

## HADARC

This month's meeting of the Hornsby and Districts Amateur Radio Club is hoped to be a Lecture plus Practical Demonstration of the Commercial High Speed Data Transmission X25. It is anticipated that members will be able to bring along their own computers and participate in the demonstration.

From QUA, here is the news of HADARC Nov/Dec 1985 AR

## DEVIL NEWS FROM THE NW BRANCH

The Florians' broadcasts on RTTY are getting a lot of response, and there are quite a number of reports to hand.

The Map Reading exercises conducted by John VK2ZPT have proved very popular (there were three classes last year), and it is hoped to conduct some more this year.

The branch has been looking into ways to cut costs in amateur radio. VK7WZ thought it would be handy to make boxes for projects and duly made a bending device for this purpose. Whilst he was visiting a local service department he inquired of the fate of many washing machines which were destined for the rubbish dump. He was told he could take what he wanted and these became boxes suitable for amateur radio projects.

VK7KY has been fortunate to locate a source of old television receivers which are proving an invaluable money saver for components, and in some cases, some television cases can be used for shelving.

The picnic to Belis Parade, Latrobe, during November was a great success, particularly the cricket match which was held on the banks of the Mersey River.

Bob VK7NAI and his family together with John VK3DJM and his mother were welcome visitors to the event. John and his mother were touring Tasmania and welcomed the opportunity to meet the amateurs from the NW Branch.

Several video cameras were seen in operation so there will probably be an interesting film night at a meeting in the near future.

At the last meeting for 1985, the Annual General Meeting, ladies were invited to attend. It was pleasing to see nine wives present. Together with three visitors and 28 members and associates, it was good to see such a large attendance for the occasion. Visitors were VK4APQ, VK7ZFH ex VK5ZFH, and Daniel.

Officers read their reports for the preceding 12 months, and thanked members for their assistance and support.

The Branch Award, which is in memory of Joan Fudge VK7ZYL, a member who worked so industriously for the Branch, was presented to John VK7AX, for the help he has given to the club.

Officers for 1986 are: President - Bob VK7KAB; Vice-Presidents - Ross VK7WP and John VK7KDR; Treasurer - Bruce VK7MB; Secretary - Tony VK7AH; WICEN Co-ordinator - John VK7ZPT; Activities Officer - Greg VK7ZBT; RTTY - Florian Biner; Weekly News Officer - Frank VK7ZC; QSL Officer - Greg VK7KY; Publicity - Ron VK7RN; Librarian - Terry VK7BV. There are two positions not filled, Youth Affairs and Components and Equipment.

Arthur VK7SE; Ivan VK7XL; John VK7KDR; Steve VK7EQ; Greg VK7ZBT and Frank VK7ZFH were selected for the Broadcast Sub-Committee.

Max VK7KY is working industriously on a QSL card design and he should just about have it right by now.

Ron VK7RN, advised club members with modems for computers to disconnect them during storms. Storms can be very damaging as Ron has

discovered.

Congratulations to Andrew Hay, who is awaiting the allocation of his limited call sign.

Many thanks to the people who have helped me with the news for the past year, particularly my wife Shirley and Greg VK7ZBT. Anyone with any news of interest please contact me or write to the club address: PO Box 194, Penguin, Tas. 7316.

Contributed by Max Handstaff VK7KY AR

## GOULBURN AMATEUR RADIO SOCIETY

It was a joyous occasion for Arne and Bill Garvey recently when they were handed their naturalisation papers by the Mulwaree Shire President, Mr Laurie Sadler. The Garveys, from Taralga, near Goulburn, came to Australia from Birmingham, UK, in 1955. Bill is probably better known as VK2CWW.



Bill has been a licensed amateur since 1978 and previously held the call signs VK2VCO and VK2KWW. He is well-known on the HF bands, especially 80m and holds a Novice DXCC as well as DXCC for 80m. He is also a well respected member of the Goulburn ARC.

Contributed by David Thompson, VK2BTD Secretary with photograph courtesy of the GOULBURN POST AR



## MILDURA ARC

During the WIA, Victorian Division celebrations in late 1984, the Mildura Amateur Radio Club were given the use of V13WI, along with other clubs and individuals.

The Club had the use of the call sign during the COWWDXCW Contest, and it was utilised for a multi-operator, single transmitter station.

Upon perusal of the results of this contest, it appears that V13WI won its category. Whilst it was no record-breaking result, it gave almost 1000 amateurs, world-wide, the opportunity to work a special call sign, and in so doing, publicised the WIA.

The Club was thrilled with the results, as this was only the second contest entered and it was quite awesome trying to work the "dog-piles" for hours on end. Hundreds of CW signals, one on top of another were not easy to decipher.

During the majority of the contest, sub-barreft power was used (less than 50 watts), as there was a problem with chronic television interference. (Operation was held at the QTH of VK3BPW, in Ouyen, where television reception is only marginal, as they are in a fringe reception area). There was also an eight-hour power black-out.

Due to the black-out, a generator was rigged up but this exploded the main transmitter - it was later discovered that the generator had voltage spikes exceeding 900 volts!

Coupled with massive power line interference, heaps of coffee, and even more paper work, in

retrospect, it was a contesting experience of a lifetime.

V13WI was VK3BPW and VK3CWB (operators), and VK2EFJ, VK3DWN and VK2KFQ (log-keepers).

Contributed by Maurice Milani VK3CWB AR

## NORTHERN CORRIDOR RADIO GROUP

Recently in the northern area of Perth, a number of amateurs banded together with the aim of forming some type of club. Unknown to them, another amateur group had made similar plans. Both groups suddenly discovered each other when they tried to book the same venue for meetings!

Surprised, but gratified by the similarity of aims, the groups joined forces and launched the Northern Corridor Radio Group (NCRG).

The NCRG meets every second Tuesday at the library foyer in Carine Technical College, at 7.30pm. In the case of college/school holidays, meetings will be held in room 101. After meeting in the foyer, we can move to the lecture theatre, canteen, or garden, depending on the agenda and weather.

Meeting activities include videos, lectures, demonstrations, discussions, Morse classes, general chit-chats, and more. The group has also visited places of interest, one being a visit to radio 6WF and the regional shortwave station, near Hamersley. All gazed upward in awe at the base of the 182m (600ft) plus tower, and decided it would be nice to borrow for 160m in the next contest! The 50KW output valves looked decidedly unfriendly.

Another successful visit was to ATC Perth Radar, at Kalbar.

A Christmas Barbecue was held at Yanchep National Park, 50km north of Perth, on 1st December 1985. An oval was booked for this enjoyable event.

The club has a permanent shack in the college and after careful negotiations, a 15m (50ft) mast has been acquired. A task force is presently devising a platform, outriggers, and an antenna rail system for the mast. It should be completed and operational by this time.



## Erecting the Delta antenna for the RD Contest.

The club station call sign, VK6ANC, has been aired frequently with the group's participation in contests and during JOJA. The activity in the Remembrance Day Contest was a day-to-day reminder. It was an excellent weekend, setting up antennas, sorting out the shack, and best of all, operating. The shack was a hive of activity and the club gained a fairly respectable score on both HF and VHF.



Testing the antennas in the shack are (from left): Nick VK6AFK, Rob VK6ZRE and Imar.



Rob VK6ZRE, Wesley and Steven do their share of operating during the contest.

The club call sign was portable for JOTA during a memorable weekend with Cubs, Scouts, Brownies and Guides at Sorrento, near the ocean. Propagation was bad but it didn't dampen the excitement for the young people.

During the CQ World-Wide DX Contest, the group was again active. Although bad propagation and indifferent antenna performances were experienced, many countries were worked during an enjoyable weekend.

With the erection of our mast and proposed monobanders, the group will certainly become a force to be reckoned with during the coming international contests.

Compiled by Nick Morgan-Hobbs VK6AFK with photographs by Phil Hartwell VK6AGL

AR

## CENTRAL COAST FIELD DAY

The Central Coast ARC will be holding its 29th Field Day on the 23rd of this month. The Field Day is very labour intensive, so help is needed.

AR

## VK3RTY IS THE HEART OF MELBOURNE RTTY

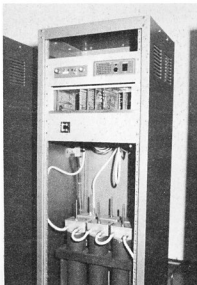
The idea of having a RTTY repeater can be traced back about six years when a group of people, interested in teletype, began work on the project. For various reasons, and despite some considerable effort put in by the group, the project dragged on and became somewhat of an embarrassment to the Eastern and District Radio Club (EMDRCL).

In late 1982, the issue of VK3RTY was raised at an EMDRCL committee meeting, and committee member, Ken Palliser VK3GJ, volunteered to take over the project.

The first thing Ken decided to do was use all microprocessor control, instead of the hard-wired logic system which was tried by the initial group. A solid-state transceiver was obtained and shielded to make it compatible with micro-control.

Ken re-designed the repeater control system and virtually the only part used from the earlier attempt was a metal housing box. He had a concept in mind on how the repeater should be micro-controlled and worked steadily to achieve success with an up and running VK3RTY, in November 1982.

During its trial period at Ken's home in Mitcham, an eastern suburb of Melbourne, it was accessed by stations from throughout the metropolitan area. After a shake-down phase, VK3RTY was installed the following February on Mount Dandenong. It opened a new era on the RTTY



The VK3RTY Repeater situated on Mount Dandenong.

scene and gave users of this mode freedom from being confined to simplex working on 146.600MHz. Users are in the greater Melbourne area, Geelong district and further away from Mount Dandenong (including Morwell, in the LaTrobe Valley) using beam antennas.

VK3RTY was the first Australian repeater to have stored messages, which can be retrieved by anyone able to access it using Baudot code.

Many stations enjoy accessing the repeater for print-outs of the stored information which is regularly updated remotely by Ken, using high speed data. They call up a menu which tells them what information is available, and the access codes needed to retrieve the messages. These pages are widely read and certainly keep RTTYers, and listeners, informed on local activities and news.



Ken Palliser VK3GJ, adjusts the VK3RTY equipment.

Available from the repeater, on command, are RY8s, Mark and Space Tones, Echo Test, and The Quick Brown Fox. These have helped, many to get their modem working efficiently and adjust their printers.

Those who initially cannot get into VK3RTY often ask a friend to activate the tests for them. Usually, soon after such an exercise, a new RTTYer is born.

In the long term, VK3RTY will have a Mail Box facility to enable users to leave messages addressed to others for later retrieval. Ken VK3GJ, has begun early work for this enhancement which will add a new dimension to the RTTY scene.

As technology develops, the man behind VK3RTY is certain to introduce further refinements in the future.

For his tremendous contribution to RTTY activity through VK3RTY, Ken was recognised by the WIA Victorian Division, in 1983, when he was awarded the Gadsden Trophy for Technical Achievement.

Contributed by Jim Linton VK3PC AR

## CLAIRVIEW RADIO CONVENTION

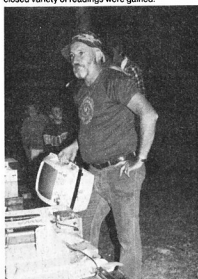
The Clairview Radio Convention, held on 9th and 10th November 1985, at the Golden Mermaid Caravan Resort, 210km north of Rockhampton, and was well-attended (53 attendees) for the second year in succession.

Amateurs, and their families, came from Hughenden, Emerald, Rockhampton, Mackay, Yeppoon, and Wynnum, near Brisbane. Max VK4BMW, and his wife Gwen VK4VDE, extended their holiday to coincide with the Convention, whilst Jack VK4VAS, and Alma VK4VAR heard about the Convention and stayed at Clairview so they could attend.

The beach-front and caravan park provided an excellent location for Fox-hunts, which proved to be a popular activity for all attending. Ron VK4EN, and Robb VK4TKA, constructed a two metre Fox with a 50mW transmitter housed in a black di-cast box for the event.

An unusual array of sniffer antennas and devices emerged from car boots, with some working better than others, of course.

During the day, Trevor VK4ZTV, tested all two metre gear with a digital frequency counter and a prize was given to the owner whose rig was calibrated nearest to 146.500MHz. An undisclosed variety of readings were gained.



Robb VK4TKA, the determined auctioneer.

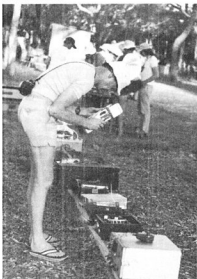


An enthusiastic audience awaiting their opportunity to buy at the auction.

On Saturday night, an auction of excess radio equipment was held, with Robb VK4TKA acting as a popular auctioneer. Black and white televisions were sold for \$3, computers \$13.50, packets of



From left: Jan VK4NTP, Ken VK4JPE and Brian VK4QB.



Trevor VK4ZTV inspects a 'treasure'.

assorted crystals \$3, and radio bits and pieces were sold from \$1 to \$25. Everybody took something home and the proceeds were divided between the Central Queensland WIA, and the Mackay Amateur Radio Club.

Thanks to all who attended to make this event such a success.

It is envisaged to hold 'Clairview 86' later this year, and anyone interested is welcome to attend, a good time is assured. It would be lovely to see



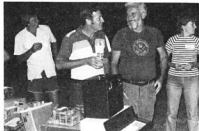
Lyle VK4ALD (left) and Ted VK4QI — it would have to be in that direction.



Wally VK4AIM (left) and Max VK4BMW, check the lots prior to the auction.

some interstate visitors this year, so time your visit to Queensland to coincide with the Convention.

Contributed by Nick Quigley VK4NFI AR



From left: Graham VK4NFZ, Roger VK4MKY, Robb VK4TKA and Marilyn VK4MPY.



Ken VK4JPE — now which way is that fox?



Some weird and wonderful devices were used to detect the fox!

LEFT: The Intrepid Fox-Hunters — from left: Ted VK4QI, Roger VK4MKY, Robb VK4TKA, Ron VK4EN, John VK4JMA (and canine friend), Jack VK4VAS, Brian VK4QB, Alma VK4VAR, Phil VK4TPK, Max VK4BMW, Lloyd VK4ALW, and Lyle VK4ALD.  
Seated: Ken VK4JPE and Wally VK4AIM.





The 'L-shaped Hand-Held Antenna'.

### WAGGA CONVENTION

The weekend of 26-27th October 1985 was the chosen weekend to hold the much awaited Wagga Convention, with the host for the weekend being the Wagga Amateur Radio Club.

It was decided to avoid the traditional New South Wales Holiday Weekend at the beginning of the month and to opt for the 26th and 27th instead. This proved to be a wise move, as it did encourage family groups to make the visit without the traffic hassles and other commitments associated with holiday weekends.

Between 150 and 200 visitors were treated to activities involving a full weekend which really started on the Friday night and went well into the Sunday afternoon. This then gave visitors a chance to get home at a reasonable hour.

The organisers were indeed fortunate to be blessed with almost perfect weather, which followed a week, or more of cold stormy conditions.

Visitors began arriving in Wagga on the Thursday and Friday and by the official start of registrations on Saturday, the Convention site, at Camp Kurralong, was a height of visitor activity.



Tony VK2ACV checks his CW speed amid the vintage radio display.



Stan VK3BSR, from Ball Electronics, with Jack VK2AY.

There was good support from the major amateur trade suppliers and visitors were able to observe some very interesting demonstrations, including amateur fast scan television, demonstrated by Peter VK2DOL and Graham VK2HL, and a slow scan demonstration by Stan VK3TE. A very interesting demonstration was the various facets of amateur astronomy and a model of the AUSSAT satellite was included.

Some RTTY, working vintage engine display by Alan VK2KAW, World War Two and vintage radio and telegraph displays were also popular.

As with most conventions, contests are the



Stan VK3TE demonstrated slow-scan television for the visitors.



The working vintage engine display by Alan VK2KAW.



Peter VK2DOL erecting the ATV antenna at the Convention site.

backbone of any such event. As well as the normal run of two metre and HF events which were organised by the Wagga Club, there was the added attraction of the finals of the National Two Metre Foxhunting Championship, which was run concurrently.

At the lunchtime break, visitors were treated to a top quality barbecue on both days. The Official Convention Dinner was held at the Riverina Australian Football Club and again there was a capacity attendance on Saturday night.

Speeches were kept to a minimum to enable a maximum of socialising and after the main meal, a trivia night concluded the evening.



Enjoying the barbecue (from left) Harry VK2AEC, John VK2TH, Jeff VK2KBK and John VK2KAO.



Some happy guests at the Convention Dinner.



Happy Hunters (from left) Phil VK1YS, Dave VK2ZYE, Doug VK2ZMP and Sid VK2SW.



The winning QSL Card.

Following the immense success of the Convention, it was decided by the Club, to hold it again at the same place, same time this year, so if you are looking for a weekend in the south west, start planning now to keep that weekend in October free for Wagga '86.

**Prize winners for the weekend were —**  
2m hidden transmitter hunts on Saturday were won by Jeff Pages VK2BY, Roy Stockman VK1KRS, and E Templeton VK3BMV.

The 2m hunts on Sunday were won by Geoff Hudson VK3CGH, Henk DeJong VK3BLI, Peter Clemson.

David Thompson VK2BOT was first in the All Band Scramble with John Lacey VK2YEZ second. The Ladies Throw was won by Francis Nugent and Louise Wheaton.







# VK2 Mini-Bulletin

Tim Mills VK2ZTM  
VK2 MINI BULLETIN EDITOR  
Box 1066, Parramatta, NSW 2150

For forthcoming activities listen to the VK2WI Sunday Broadcasts for further details.

## FIELD DAY

The Central Coast Amateur Radio Club will hold their Annual Field Day at the Gosford Showgrounds on Sunday, 23rd February 1986. There is plenty of off-street parking and several large covered areas for displays and exhibits. The event is not affected by weather conditions. Newcastle and Sydney trains are met. It is an ideal outing to see old friends and to browse through the trade exhibits.

## CONFERENCE OF CLUBS

The next Conference of Clubs will be hosted by the Orange Amateur Radio Club and will be held in Sydney over the weekend of 19-20th April. The meeting will deal with both its own agenda items as well as consider the Federal Convention items. The Agenda closes in late February.

## SEMINAR

The next VK2 Seminar will be held on Saturday, 8th March, at Amateur Radio House. This will also be the end of the Divisions celebration of the 75th Anniversary year and the closing off of the Time Capsule. If you would like to include your QSL card or similar, bring it along, or post it to the Divisional Office. The Time Capsule is to be opened on the 100th Anniversary of the Institute in March 2010.

## ANNUAL GENERAL MEETING

On Saturday, 5th April 1986, the Annual General Meeting of the Division will be held. A separate posting of the notice of the meeting, agenda, and annual report will be sent to members in March. The AGM also means a new Council year and nominations are called to fill positions on the Council. Nomination forms are available from the

Office. Agenda items and nominations are to reach the Divisional Office during early March.

## SUBSCRIPTIONS DUE

Most members will have received their renewal notice during December. If you still have to attend to this matter please do so now to enable the continuity of Amateur radio magazine and your membership. The introduction of an in-house computer in the Federal Office has enabled the phasing-in of cyclic billing to those members who joined during 1985. Any member who joined during 1985 will receive their renewal a couple of months before the anniversary of joining. All other members who were members prior to 1985 are calculated as having joined on the 1st January. Your renewal date is included in the AR address label. For several years the Division has been able to maintain subscriptions at the present level. This is possible by maintaining (and increasing) a high level of membership.

## FEDERAL COUNCILLOR

For some years, our Federal Councillor has been Steve Pall VK2PS. Steve has retired from this position as of the end of 1985. His place has been filled by Jeff Pages VK2BYV from 1st January. Alternate Federal Councillors are still Tim Mills VK2ZTM and Wally Watkins VK2DEW.

## CALL BOOKS

A reminder that the current Call Book is available for \$6.00 from the Divisional Office during office hours — Monday — Friday 11am — 2pm and Wednesday evening at 7pm. If you require a copy to be posted add \$2.00 for postage and packaging. The Call Book is also available on Bankcard. Telephone (02) 689 2417 during the above times.

Club members check with your club, as several clubs are carry stocks of the Call Book.

## UHF TELEVISION

It was announced in late December, that the Wollongong region is to change to a UHF-Only television service within three years. The existing channel 4 commercial will be phased out to enable the channel in the area to revert to FM broadcasting. Channel 5A (Wollongong would also disappear. All existing and future services will then be only on UHF. The area already has UHF SBS.

## BEACONS AND REPEATERS

The Division recently added 23cm to its beacon network at Dural, under the call sign VK2RSY — 1296.420MHz. A QSL card will be exchanged for all reports received. The beacon network will be expanded into the microwave region. The next planned frequency is on 10GHz.

VK2RCW, HADARC's Auto Morse Machine, is in the process of changing its two metre frequency to 144.950MHz; one of the channels in the band plan for this type of service. By the way, have you been making much use of the 80 metre outlet on 3.699MHz? Reports and comments are welcomed by HADARC at PO Box 362, Hornsby, NSW, 2077.

An application for a Packet repeater has been received from Coffs Harbour ARC. It is to be co-sited with their existing RCH 6650 service. Advice has been received that Packet Repeaters are planned for Port Macquarie and Lismore. Oxley Region ARC are to add a UHF voice service to their existing RPM 6700 outlet.

Investigations are continuing with two metre repeaters, particularly those in the top megahertz area, on how best to operate with the paging network which utilises the adjacent frequency allocation from 148MHz and up. Questionnaires were circulated to repeater groups late last year, to help identify the major problem areas.

AR

# VK3 WIA Notes

## WIA VICTORIAN DIVISION

412 Brunswick Street, Fitzroy, Vic. 3085



## NEW BEACON

A new beacon should now be operational with the call sign, VK3RCW.

This beacon is situated in the Waverley area of Melbourne and generates CW practice at both five and 10 WPM continuously for 24 hours-a-day. The code is in groups of five mixed alphabet and number characters which are computer generated. Those who wish to upgrade, or just to keep up your speed, listen on 144.950MHz FM.

## CHECKS AVAILABLE

The Department of Communications has made available to VK3 amateurs a frequency and deviation check for two metre transmitters.

By contacting the DOC monitoring station at South Morang, and making the appropriate arrangements, you can have these checks done. Thank you DOC for making this service available.

## QSL BUREAU

The Inwards QSL Bureau is getting a large backlog of cards awaiting collection. The reasons for non-collection of your QSL cards are many and various. Some of these reasons would appear to be a lapse of postal credit, change of address, or maybe just dis-interest.

Please assist the Bureau by either getting your address correctly notified and listed, ensuring you have sufficient postage credit so that your cards can be mailed to you, or if you are not interested in QSLing, then tell the other station you do not wish to QSL.

Whilst on the subject of QSL cards, it is essential to ensure your cards are of the correct dimensions. The size 140 x 90mm is the optimum for postage, as it makes the parcel easier to wrap and is in line with the International preferred size.

Cards bigger than this size will be damaged by folding. To further assist the Bureau, the recipients call sign should be at the top right hand side and cards sorted alphabetically.

Your co-operation with these requests will not only assist you, but will also help to ease the workload of the volunteers who sort your cards at your free QSL Bureau.

Contributed by Bill Wilson VK3OKE AR

## WARM WELCOME EXTENDED

The VK3 Division of the WIA would like to extend a warm welcome to the following new members.

Ian Ampt VK3CH; Willem Beyer VK3BHW; John Cameron; Gordon Cornell; William Costello VK3DWC; Graeme Davidson VK3KQO; Richard Djubek VK3DXQ; Noel Funge VE4CF; Geoffrey Heale VK3CG; Peter Haines ZL4LD; Dennis Gordon G3YSV; Keith Levens VK3PLK; Stuart McKenzie; Geoffrey O'Hoy VK3NGC; D. Olley 302DW; J. O'Rourke VK3XS; Gregory Rice VK3VRU; Mrs J. Rice VK3VRU; Doug Rolfe VK3XKG and Elizabeth McLachlan.

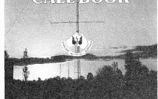
Congratulations on your membership and welcome to the Institute.

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# NOW AVAILABLE

1985-1986 AUSTRALIAN RADIO-AMATEUR

## CALL BOOK



LIMITED COPIES OF THE  
1985-86 WIA CALL BOOK  
ARE NOW AVAILABLE  
FROM DIVISIONAL  
OFFICES

Price: \$6.50 + P&P

AR86



# VK4 WIA Notes

Bud Pounsett VK4QY  
Box 638, GPO, Brisbane, Qld. 4001

This month's notes centre around photographs taken by Bud Pounsett VK4QY, during the Commemoration of the first television transmissions in Queensland.

The South East Queensland Amateur Television Group honoured the memory of television pioneer, Tom Elliot, who in 1935, transmitted television pictures from Brisbane's Tower Mill to Ipswich.

Amateurs and friends gathered at the site on the morning of 6th October 1985, and after a brief ceremony, proceeded to the historical Society Building in William Street. There they viewed the original equipment used by Tom.

AR



Tom VK4ABA, ably compered the proceedings, watched by cameras from all Brisbane channels, who recorded the event.



Ann VK4KZX and Guy VK4ZXZ, dressed for the occasion in the dress of the day.



John Aarsse VK4QA, spoke on behalf of the Queensland Division.



Eddie White VK4OW, and part of the group at the Tower Mill.

Above:  
Mr Campbell, a colleague of Tom Elliot, recalled the man and his work for an appreciative audience.



Part of Tom Elliot's original equipment on display in Brisbane's Historical Society Building.

**Did you know?**  
On 19th February 1878, Thomas Edison patented the phonograph.



# WA Bulletin

# Five-Eighth Wave



Jennifer Warrington VKSANW  
59 Albert Street, Clarence Gardens, SA. 5039

The final meeting of the year has come and gone, and as usual the December meeting took the form of a Christmas Party. This was held, as it was the previous year, in the restaurant area of the Westral Centre, in East Perth.

Following complaints from country groups that holding the party on a Tuesday evening — the normal meeting night, made it impossible for country members to attend, we broke with tradition and held the party on a Saturday. We booked for 120 people, which has been the average attendance over the last five years and sold tickets at the cost price of \$10 per person.

It soon became evident that Saturday was not a very convenient night for some due to other parties, previous engagements, and, in some cases, baby-sitting chores. Arrangements were made with Westral to reduce the booking to 100 people and although ticket sales were slow, it was hoped to make up the numbers at the door. This never happened and total attendance was 76, including two members from the outer metropolitan area and just one from a country group.

## WHAT IS THE ANSWER?

This means that, for the first time, the Christmas party was run at a loss. One wonders what the solution is? On request, we held the party on a Saturday to enable country members to attend and as shown, we do not get any support. It is certainly something for the 1986 Council to think about.

The party itself was excellent with the catering being first class. Guests of Honour were the State Manager of the Licensing Department of the Department of Communications, Mr Barry Field and Mrs Field, and the Western Australian Manager of Dick Smith Electronics and his guest.

## PRESENTATIONS

During the evening, several presentations were made commencing with the winners of the WA 80 metre SSB and CW Contests.

Following this the annual presentation of the Amateur of the Year Award and Certificates of Merit were made. The holders for 1985 are:

### AMATEUR OF THE YEAR

Fred Hull VK6FH, for his work over the years in promoting RTTY, digital techniques, packet radio, and helping many people in all aspects of the hobby.

## OUTSTANDING SERVICE TO AMATEUR RADIO CERTIFICATES

Don Reimann VK6DY, for many years service to WICEN.

Will McGhie VK6UU, for work on repeaters and other techniques to improve the news service.

1985, being the 75th Anniversary of the WIA, the Division was allocated 24 medallions for presentation to commemorate the year. These were made as follows:

North West Radio Society, Amateur Radio Instructors — accepted by Dave Couch VK6WT, on behalf of those involved.

WICEN.

Geraldton Amateur Radio Group.

Goldfields Amateur Radio Group.

Southern Electronics Group.

VHF Group.

Repeater Group.

Wireless Hill Museum.

AARTG.

Old Timers Group.

YL Luncheon Group.

Northern Corridors Group, which was formed in 75th year.

Midland Amateur Radio Society, which was formed in 75th year.

South West Amateur Radio Group, which was formed in 75th year.

Peel Amateur Radio Group.

Perth Radio League.

Dave Wallace VK6IV, council in 75th year.

Christine Bastin VK6ZLZ, council in 75th year.

Cliff Bastin VK6LZ, council in 75th year.

Cyril Rice VK6MY, council in 75th year.

Alyn Maschette VK6KWN, council in 75th year.

Jill Weaver VK6YL, council in 75th year.

Douglas Gordon VK6ZMG, council in 75th year.

Medallions had already been presented to Neil Penfold VK6NE and Bruce Hedland-Thomas VK6GDC by the Federal Body as being Federal Councilors.

In allocating certificates or medallions, the Council is presented with an unenviable task. There are so many who give their time in contests, news relays, scouting, instruction, and so many other aspects of the hobby that the list would and should be endless. Ours and all members thanks are freely given and may you all get out of the hobby as much enjoyment as you give.

Finally, a big thank you to Christine VK6ZLZ, long suffering wife of VK6LZ, who put in 99 percent of the work and organisation of the Christmas Party — we support you Christine.

AR

# Forward Bias

Ken Ray VK1KEN  
Box 710, Woden, ACT. 2606

shattered as hordes of wild amateurs were to track the elusive VK1 Fox. Dennis VK1DG, was the Fox, with seven teams of amateurs scouring Canberra suburbia for glory, honour, and that little black box. The victors were Roy VK1KRS and Richard VK1KAB. They were closely followed by Peter VK1DS and Tom VK1BUD.

All had an excellent time, thanks to Dennis VK1DG and Dick VK1ZAH. The last word on the subject must go however to Oscar Wilde — "One knows so well the popular idea of health. The English country gentleman galloping after a fox — the unfeasible in full pursuit of the unfeasible."

## FIELD DAY CONTEST

The Division's John Moyle Contest Station will be located at Bulls Head, in the Brindabella Ranges. If you would like to participate, contact Alan VK1KAL, or any of the Committee.

AR

I have received a complaint (so what else is new?) from Ken Westerman VK5AGW, that I failed to mention what a great time the Alice Springs Radio Club gave him and his wife Jann, when they were at Alice Springs during the latter part of 1985.

They have been having problems with the Alice Springs repeater, which is being interfered with by the Emergency Services vehicles at the airport, which is where the repeater is located. Last time I had communication with the Club, they were about to contact DOC regarding a change in frequency for the repeater. They are also hoping to put up a couple of beacons very soon.

## REGRETFULLY ACCEPTED

Towards the end of 1985, we regretfully accepted the resignation of Jack Coulter VK5JK as Divisional Historian, due to ill-health. Jack's position has been filled by his long-time friend, Ray Bennett VK5PM. Ray has been a teacher for part of his life, and one of his subject was — you guessed it — history. To Jack, for what he has done over the past few years, and to Ray for accepting the position, we say thanks.

## OFF TO THE FAIR

This year, for the first time, we participated in the South Australian Hobby Fair. This proved to be a most enjoyable event with lots of help from the organisers, parking in the showgrounds and plenty of interested spectators. Next year, I gather that the ATV Group and the Southern Cross DX Club would like to see us all under the one banner, so to speak, it sounds like a good idea to me.

I enjoyed myself on the Saturday night on Amateur Television, my first on-air experience, and once I had got over the initial self-consciousness, they probably wondered if they would ever get rid of me. Thanks fella, it was great.

My thanks must also go to those who assisted with the WIA display. Peter Koen, Lindsay VK5GZ, Jack VK5FV, Ben VK5AOL, Cyril VK5KEM, Ron VK5AAC, Max VK5NMX, Steve VK5AIM, and anyone else that I may have forgotten.

## PROBLEMS WITH CHRISTMAS

Although I have been told by a few people how much they enjoyed our Christmas meeting this year, there were a few grumbles. The hall, and in particular the kitchen, left a lot to be desired. This was partly my fault as I had not checked it out, believing that it would naturally be of a similar standard to the one next door. My apologies to Wendy Clegg and the ladies and our thanks that the poor conditions certainly weren't reflected in the supper they served.

The lack of an amplifying system for the speaker and myself, was also a lack of checking on my part. My apologies to those who rated us only a readability 3, strength 2!

## DIARY DATES

Tuesday, 25th February 1986 — General Meeting.

AR

## WANTED KNOWN — CAN YOU HELP?

The whereabouts of the family of the late Leo G Cohen, Telegrapher and master of the Simplex Auto Bug. I am researching the history of Cohen Bugs, when they were made, where they were made, and the character of Leo, himself. Any information, no matter how minor would be appreciated. Contact Laurie VK3CWB. Phone (050) 22 2120 reverse charges, or write PO Box 2742, Mildura, Vic. 3550. Old Timers, your help is needed!!!



# Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

## COMMERCIALISM

When I read of the proposed operation of VK9LC in December's **AMATEUR RADIO**, page 42, I felt that there must be some mistake — such blatant abuse was unbelievable.

Subsequently, I found out that there was no mistake — I received a note asking for payment for the QSL card.

Cards obtained under such circumstances should be worthless for any award. No award that allows such abuse can be of any value.

The WAS and WAWKA (VHF) Awards represent significant achievements, they must not sink into the mire.

73,  
Gill Sones VK3AUI,  
30 Moore Street,  
Box Hill South, Vic. 3128.  
AR

## AMATEUR LANGUAGE

Referring to Jim Linton's letter in December's **AR**, entitled "Help Save the Amateur Radio Language".

"Amateur Radio Language" is the language of people having fun pretending to be members of an exclusive group. CB is a language of another community of amateurs and when there is a migration between the two communities each language will adopt parts of the other.

The only way to "stop the rot" is to actively oppose bad operating and the use of esoteric language. A good R/T operator is a joy to listen to and the distinguishing characteristic is the almost exclusive use of plain language. A good R/T operator would not use telegraph abbreviations and codes, and would know the correct meaning of QRT and QRX? A good telegraph operator would not use QRX or QRT as a request to 'wait' or 'standby'. (See the AOH, paras 8.7 to 8.9).

Lindsay Lawless VK3ANJ,  
Box 112,  
Lakes Entrance, Vic. 3909.  
AR

## NET HF FREQUENCY FOR VHF LIAISON

In reference to November 1985 **AR** and in reply to Charlie Gnaccarini VK3BRZ, regarding an HF calling frequency, I basically agree with the statements made but I wish to let the membership know that 14.103MHz and 7.055MHz +/- QRM have been used for VHF/UHF liaison for some time now. However, combined licences for limited and novice operators need to liaise also so may I suggest 3.580MHz +/- QRM as a crystal for this frequency is cheaply available from VK2DJK.

With this frequency and AM or LSB nobody will be excluded as a simple home-brew transmitter will do the job.

I hope this will be of assistance to the readership. The net is on Saturdays, 0330UTC on the 14 and 7MHz frequencies.

Yours sincerely,

Micha Lohse VK4JHM,  
PO Box 849,  
Atherton, Qld. 4883.  
AR

## THANKS TO THE PRESIDENT

The 75th Anniversary Celebration of the Wireless Association of Australia was a grand affair, and I am proud to have played a small part in your activities. You have a rare distinction, being the world's oldest amateur radio society. Furthermore, you have the distinction of wielding a great influence on the course of international amateur radio. As I tried to point out in my brief remarks at the Anniversary Banquet, people make the difference in any organisation, and it is clear to see that the WIA has been blessed with some outstanding people.

I congratulate you and all of your associates who were responsible for the calibre of the Anniversary — it was outstanding.

Thank you for the courtesies extended to my

wife and myself during our visit to Melbourne and Australia. We enjoyed every minute of our stay, and only wish that we could have taken more time to travel about. We thoroughly enjoyed the scenic tours, and only hope that we can get another opportunity in our lifetime to a repeat through some other scenic portion of Australia.

73,  
Sincerely yours,

Richard L Baldwin W1RU,  
President,  
The International Amateur Radio Union,  
Maine, USA.  
AR

## THANKS FROM GIRL GUIDES

On behalf of the Girl Guides Association of Australia, I would like to sincerely thank members of the Wireless Institute of Australia for their untiring assistance given to the Guides and Scouts during the 28th Jamboree on the Air.

The fun and fellowship provided by the international event would not be possible without WIA members help and is gratefully appreciated by all of us.

Yours faithfully,

Mrs June Rettallack,  
Australian Guide JOTA Liaison,  
224 The Strand,  
Bedford, WA. 6052.  
AR

## LEPRECHAUNS

The footnote appended to my article quote: "Propagation via Reflections from Aircraft" elsewhere in this issue is correct in that I have not disproved the proposition that balls of hot air may enhance signal levels.

Similarly logical explanations for happenings attributed to Leprechauns will not disprove their existence either.

73,  
Gordon McDonald VK2ZAB,  
59 Wideview Road,  
Berowra Heights, NSW. 2082.  
AR

## YOUNG THOUGHTS ON AMATEUR RADIO

This is written in response to a large number of letters and articles in recent issues of **Amateur Radio**, about the future of our hobby, amateur radio.

At the end of the year in which the WIA celebrated 75 years of service to the amateur community, it seems appropriate that people are questioning how the WIA, and similar associations, can continue to serve amateur radio, and the future of amateur radio in general.

Considerable concern is, justifiably, being shown over the increasing average age of the amateur population. Some of the fault lies with the way the hobby is seen by the younger generations, and I think Lindsay Lawless summed up a major problem in this area with his letter (November **AR**). The hobby is advertised as too expensive, and the general aim of promotional matter seems graded to older readers.

From what I have gathered, I am one of the younger amateurs, being all of 18 years old. There are, I am sure, several others my age and also some younger. It seems, however, that we are the unusual ones. We are the ones with amateur parents, or a genuine interest in radio which brought amateur radio to our attention. I was lucky, I had a cousin with a CB who was studying for, and now has attained, his amateur licence. He interested me in CB and from there I started SWLING and graduated to amateur radio. I was particularly encouraged by Matthew Cullen VK3VRO, at that time a 12 year old, who I QSLed. With other encouragement, and driven by a now avid interest in the hobby, I obtained my Novice Licence in May 1985. If I had not been encouraged, particularly by young Matthew, I

would probably not be writing this today.

So, I was lucky. But what about the others who are not so fortunate and who were perhaps never introduced to SWLING? I still do not possess any amateur radio gear. I keep my interest in the hobby alive by SWLING on the shortwave bands using a four band radio-cassette recorder.

I think we need to promote the hobby to the younger generation and as Lindsay says — the best way to do that is through the young people.

Whenever I get the opportunity, I advertise the hobby, but more is required. Maybe something which can capitalise the habits of today's young.

We don't need a new tradition, as suggested in the CQ editorial (reproduced in November **AR**) but we do need a unicorn but the tradition is fine. What we really need is a new image, a modern image — an image that does away with the idea that amateur radio is a restricted, exclusive club for old folks.

In the interest of making sure there is amateur radio around for the celebration of the WIA 100th anniversary, it is time to start encouraging the younger people to take an interest in the hobby. Those of us who are young now will not be sufficient to keep the WIA alive in the years to come, and when we are gone, who is going to advertise then? I doubt the there will ever be a stage in amateur radio when there are no young folk left, but I would like to see more at this present time, to ensure the continued growth of the hobby.

If my services can be put to use for any promotional, or other activity, I would be more than willing to 'chip in' and help, (provided it does not interfere with my studies), and I look forward to celebrating 25 years of being a licensed amateur in the year 2010. With the grand 100th anniversary, and starts planning for the second 100.

Cheers, from a radio-less amateur,  
Conrad Canterbury VK3PHW,  
28 Pyke Street,  
Tatura, Vic. 3616.  
AR

Thanks for the offer, Conrad, but you are still expecting us older amateurs to tell you what to do, and this is where we need guidance from your generation. We look forward to more of your well-considered thoughts. — Ed.

## THE YOUNGER SET

I am one of the one percent of radio amateurs — those under the age of 20. I am at a school where there are no other people interested in amateur radio. However, there are many people interested in electronics (which is taught in the physics course), and many interested in computers. Amateur radio, as it appears, is not appealing to them, but data communication, mailbox, and program exchange is of interest.

I was very interested to read the Discussion Paper: **Amateur Radio — Future Direction**. I confirm the observations in this report in all respects. I fully support the recommended enhanced novice, intermediate and telephony licences.

I believe that this suggested system would encourage many young people to gain a licence. By careful allocation of frequencies, now unoccupied bands could be revitalised. One organisation has taken the initiative to supply easy-to-build kits for amateurs. These projects and similar are excellent starting projects and provide a cheap start. The recommended licenses have the possibility to do good things for our great hobby.

Sincerely,

Jonathan Marshall VK3PNN,  
30 Somers Avenue,  
Malvern, Vic. 3144.  
AR

## COMPUTER INTERFERENCE

Is there any possibility of an article by an expert on RFI in relation to computers and amateur radio? I refer to interference generated by the

computer and seek practical means of overcoming this problem written in fairly simple language for old timers to understand.

There does not seem to be much available on this subject.

73,

Tom Thorpe VK2GT,  
Kelson Cottage,  
Oxley Drive,  
Mittagong, NSW. 2575.

*This has been a serious problem in other countries and has been tackled in the USA by much more stringent FCC rules as to the allowable radiation levels which manufacturers must satisfy. We would welcome articles on how to improve computers which pre-date these rules, if it is economically possible. Ed.*

AR

## APPRECIATION

I would like to register my appreciation for the assistance given to me by Phil Birchdolt whilst doing the Novice Course 1984-85, which resulted in my obtaining my novice licence and the call sign 3K3VB.

Following this, I continued with the AOCPE course instruction by Fred Swainston in 1985 and obtained my full call VK3CJT at the February examination. I finished the course in May and thoroughly enjoyed the experience. The revision weekends provided were excellent and I feel really lifted me to face the exams with confidence.

Since then, I have really enjoyed amateur radio and have found some wonderful friendships to make my retirement so much more enjoyable. I was an operator during WWII and have found many such fellows also enjoying this experience and, like myself, still hooked on pounding brass.

I look forward to many years of being on air just as I look forward to the beginning of each month and my copy of AR arriving.

Again, with sincere appreciation of the work of Phil and Fred put into stirring my 'grey-matter' to achieve the ultimate blue certificate and opening the way to making so many friendships at the classes and on air.

Jack Barrett VK3CJT,  
9 Charles Street,  
Ascot Vale, Vic. 3032.

AR

## TECHNICALLY SPEAKING — PEAK ENVELOPE POWER

Help! It seems to me, and to a number of fellow amateurs with whom I have discussed this subject, that there is an urgent need to clarify seemingly opposing views as to the method of arriving at this important measure.

The ARRL 1985 Handbook says, in reference to a non-specific composite waveform, see page 2-23, that to compute PER, "multiply the PEV by .707 to obtain the RMS value, square the result and divide by the load resistance", that is:

$$PEP = \frac{(PEV \times .707)^2}{R} = \frac{ERMS^2}{R}$$

but we know that

$$\frac{ERMS^2}{R} = \text{mean or average power.}$$

so this reference says that PEP = mean power.

On the other hand, the same Handbook says, in the context of a two-tone signal, see page 18-14, that:

$$PEP = 2 \times IRMS^2 \times R = 2 \times \text{mean power} - 2.$$

The Amateur Operators Handbook by the then Postal and Telecommunication Department, agrees with this, see paragraph 5-43, page 19, where it states:

$$\text{Mean Power} = IRMS^2 \times R \text{ or } \frac{ERMS^2}{R}$$

and that PEP = 2 x mean power - 2.

As if that isn't enough, Mr N Cooper VK4ZNC, says in the context of a two-tone signal, see AR for December 1977, page 39:

$$PEP = 2 \text{ tone RMS power } \times (\sqrt{2})^2 = 2.467 \times 2 \text{ tone RMS power} - 3.$$

(Note: There is strictly speaking, no such thing as "RMS" power. The correct name for power obtained from the product of RMS voltage and current, and variants involving R or Z, is "mean" or "average" power — see Alternating Currents, by A E Clayton, and ARRL 1985 Handbook, page 2-23).

The confusion caused, (to me, at least) by these apparently divergent views, is not clarified by various statements and definitions in the literature, all more or less supporting relationship — 1. above, viz:

From "Single Sideband for the Radio Amateur", ARRL, 5th Edition:

(a) "Peak Envelope Power is the instantaneous power at the peak of the modulation cycle" page 251

(b) "Instantaneous or peak RF power is 2 times PEP" page 217

(c) "Peak Envelope Power is the average power (ie not instantaneous or peak power at all) of the highest amplitude signal measured over one RF cycle" page 217

(d) From the ARRL 1985 Handbook, page 2-23:

"The definition, peak power = peak volts x peak current = 2 x average power

conflicts with the meaning of the term when used in radio work, and peak power output of a radio transmitter is the power over the RF cycle having the greatest amplitude and

(PEV)<sup>2</sup>  
2R

(e) By David P Smyth, CQ February 1969 as reprinted in AR for August 1969, page 15:

"Peak Envelope Power is not simply peak voltage squared divided by the impedance as many amateurs believe"

These apparent inconsistencies came to light when preparing to calibrate a meter to read PEP when it appeared that, depending on which approach was adopted a difference of 2 times (even 2.467 times) could result.

However, I suspect that all of these versions could probably be seen to be consistent if only the respective conditions were clearly understood, or at least specified, but they seldom seem to be. It seems to me that a minimum requirement is an easily understood, unambiguous, agreed definition of what is meant by Peak Envelope Power.

Would it be possible to have an authoritative article published in AR, bringing all these differences together, and defining in clear and unambiguous terms, with accompanying diagrammatic and mathematical support, Peak Envelope Power, and detailing how the radio amateur can measure it, in practice.

As a separate, but related issue, there must be many linear amplifiers in use by the VK amateur fraternity, designed to deliver power outputs well in excess of the legal limit in this country.

There appears to be a lack of information on how to properly adjust and operate these monsters, so as not to exceed that limit, and it is suggested that this also, would be a suitable subject for an article by an appropriately qualified member of our amateur fraternity.

I am sorry to be posing a series of questions, but no answers.

Yours faithfully,

Ken Andrews VK2ATK,  
32 Aeolus Avenue,  
Ryde, NSW. 2112.

Ron Cook VK3AFW, attempted to resolve the problem in Novice Notes for June 1981, entitled "Peak Envelope Power — What is it?" Some corrections were published in November 1981. They left the basic conclusions unaltered. PEP and mean power are the same for unmodulated CW. For two-tone and more complex modulation mean power is less than PEP. The VK3AFW article answers most of the above questions. Ed

AR

On, or about 21st February 1958, the first electric burglar alarm was installed in Boston, USA.

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CONTACT US FOR QUOTES

# Silent Keys

*It is with deep regret we record the passing of —*

MR G S 'ANDY' ANDERSON	VK2KGA
MR R H BAINES	L30009
MR HUGH CLAYTON	VK4AHC
12TH DECEMBER 1985	
MR D P DAVENPORT	VK3AWA
4TH OCTOBER 1985	
MR HARRY ELLISON	VK3DRO
19TH DECEMBER 1985	
MR WILLIAM LINDSAY GRIMSHAW	VK2EWG
23RD FEBRUARY 1985	
MR R F HARRINGTON	L50070
29TH JUNE 1985	
MR A V MACY	VK3BYB
MR W K CARTHUR	VK2DCS
MR H W MCKAY	L30034
MRT J MEAD	VK2EJM
MR A E 'ROBBIE' ROBERTSON	VK2US
9TH SEPTEMBER 1985	
MR J P ROSEWARNE	VK5MN
27TH JULY 1985	
MR E M SIMPSON	VK2ES
21ST JUNE 1985	
MR E V SPAILE	VK2YDS
13TH JULY 1985	
MR KEVIN JOHN WATSON	VK2BLW
29TH NOVEMBER 1985	
MR H A WHITE	VK3AGK
1ST NOVEMBER 1985	

## Obituaries

**HUGH CLAYTON** VK4AHC  
Hugh passed away at his home on 12th November 1985.

He was licensed in 1938 with the call sign VK4AE. At that time he was residing in Bundaberg, Qld. He spent most of his operating time on six and 10 metres.

I first met Hugh in 1938, when we were both employed as radio mechanics for the same firm in Bundaberg.

Hugh was an Englishman, and worked on the land when he first arrived in Australia. He served in the last war and was Sergeant. I lost touch with him during the early part of the war but caught up with him again around 1943, when we were in the same unit.

He was a perfectionist, his gear was always immaculate and looked very professional. He was Chief Engineer at 4BU prior to his retirement in 1972.

Apart from his very professional approach to radio, not too many knew that he was also a very competent pianist and organist. His knowledge and experience would be a great loss to amateur radio.

Deepest sympathy is extended to his wife and family.

Claud Singleton VK4UX  
AR

**A E 'ROBBIE' ROBERTSON** VK2US  
A E 'Robbie' Robertson was born in Liverpool, England, on 16th July 1908. He attended radio classes at the Marconi School of Wireless and graduated in 1924 with his radio operators licence. He became a radio officer with the Blue Funnel Line shipping company.

In 1931, Robbie migrated to Australia, gaining employment with AWA in 1932 as a radio operator on ships in the Australian Coastal Service. He was married in 1936 and, while still living in Melbourne, became an amateur operator in 1938. He was transferred with promotion to Sydney in 1941.

During the war years, Robbie became a ground radio maintenance engineer with QANTAS. He also flew as a radio operator on QANTAS aircraft (Flying Boats, Lancasters, etc) in those years.

As QANTAS began to plan for new equipment, Robbie was appointed Radio Projects Engineer. He became responsible for the selection and introduction into service of many types of electrical equipment in L749 Constellation, L1049 Super Constellation, B-707 and B-377 aircraft. These responsibilities involved trips to USA and Great Britain for courses and conferences.

Among the many interesting developments were tests carried out in 1967 using Boeing 707 aircraft, in which satellites were used to relay signals from aircraft on the Trans-Pacific route. During the satellite program, VHF contact was made from the aircraft sitting on the tarmac at Mascot Airport to Seattle, via satellite. The satellite was 8 degrees above the horizon at Mascot at the time.

At 61 years of age, Robbie retired from QANTAS, and went back to radio school to get his Marine Operators Certificate revalidated, then returned to coastal shipping, until he retired again in 1972.

Robbie died on 9th September 1985 at the age of 77.

**KEVIN JOHN WATSON** VK2BLW  
When a man sets out with a vision, little can stop him in his pursuit.

Kevin John Watson VK2BLW, was one such man.

His sudden death on 29th November 1985, closed a chapter in the amateur radio history of the Hunter Valley, for which all can be justly proud.

Born in 1924 at Maitland, Kevin lived all his life in the area except for the time he spent in the service of his country during the Second World War when he was stationed in New Britain and the Islands.

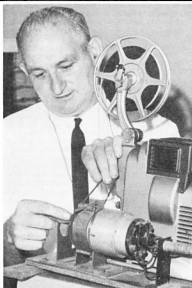
On his return in 1946, he began work with the PMG as a linesman. He quickly showed his ability, and before long was given the position of cable recorder, the first in the district. His continual search for, and achievement of skill, led him quickly to promotion. Soon he was with the indoor staff as a draughting officer. He held various grades of this position until his retirement from Telecom in April 1985.

Kevin married Margaret Holmes in 1948, a union which produced two sons, Gary and Allan, and three grandchildren.

Kevin's life could best be described as one of service and achievement — he was always ready to help out in time of need. This was obvious in his war service, but it was heightened in many ways by the natural disasters which beset the Maitland District.

When the fertile Maitland valley floods, much of the city is inundated. In the days before good communications were available, these times were disasters beyond belief. The flood of 1955 was probably the greatest the city has experienced and for seven days all road, rail, and most telephone links were severed. A disaster communications centre was set up at a high point in the CBC bank. Kevin was the message operator and for seven days and nights he remained at his post. During much of this time he was Maitland's only link with the outside world.

Always keenly interested in radio, Kevin became involved with the Maitland YMCA Radio Club in a halcyon days when the Youth Radio Scheme was drawing young people to the hobby. His aim though, was to make an independent club and he worked and guided the members towards this goal. In 1967, the dream came true and the Maitland Radio Club opened its extensive



Kevin taken at the official opening of the Maitland Radio Club premises in 1967. Photograph courtesy of THE MERCURY, Maitland.

premises in Tenambit, on high ground above flood level. This was to be the communications base for Maitland and the training ground for young radio amateurs.

Maitland Radio Club was one of the most progressive and dynamic organisations of its kind in Australia. As a direct result of Kevin's efforts, dozens of young people found satisfaction and enjoyment leading to a career in radio and electronics. Scores of others heard the hobby's message because of the hard work put in by VK2BLW. And his own family were not out of it by any means. Gary, now VK2ZKW, his father's first call sign, Allan and Margaret all became actively involved in Club activities. That both his sons are now secure in their own business enterprises shows the strong guiding hand of their father. His enthusiasm went far beyond making amateur radio just his own hobby.

But, this well-balanced man had other hobbies as well. One that he pursued with great enthusiasm was film making and amateur cinema. His house contained a well equipped cinema and he had a special ability to be able to make his own and others pictures live again on the screen by the use of his rare skills. Those who saw his shows, agreed that here was amateur cinema at its best.

Late in life, Kevin took up flying and he soon gained his pilot's licence, planning all the time for his retirement, so little of which he was to enjoy.

His devotion to his family and his many friends and associates came suddenly into focus at his funeral which was attended by well over 200 mourners.

The radio amateurs of the Hunter Region will long remember the great contribution made to our hobby by Kevin John Watson VK2BLW.

Written by Keith Howard VK2AJX from information researched by John Rogers VK2JRR.

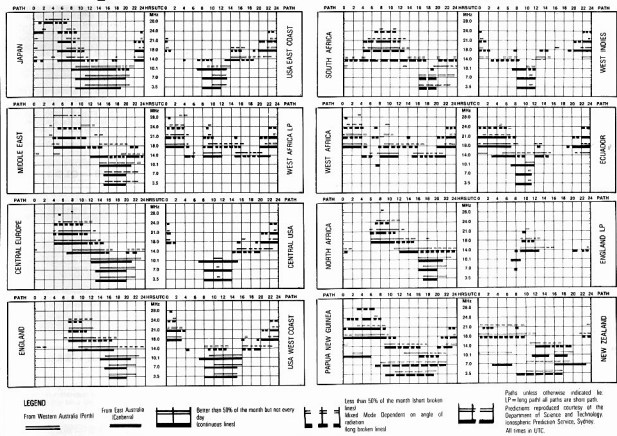
AR

## THOUGHT FOR THE MONTH

*When you argue with a fool — two fools are arguing.*

# Ionospheric Predictions

Len Poynter VK3BYE  
14 Esther Court, Fawkner, Vic. 3060



## BILL AND THE MORSE PRACTICE

Bill Blitheringtwit was sitting in his shack waiting for the front door bell to ring. On the desk in front of him was a curious device connected up to a Prehistoric Morse key and he was idly playing with it, causing weird wailing noises to issue forth. Then there came a long loud ring. Bill got up and shuffled to his front door. A grey haired man was standing there. This was Fred Northing, a life-long friend.

"Hallo, Fred", said Bill, admitting him.  
"Evening, Bill", replied Fred, walking in.  
They both went to the back of the house where Bill's shack was. Fred was carrying a small box.  
"You got it?" asked Bill.  
"Yes", Fred replied.  
Once in the shack, Fred opened his box and withdrew a Morse key and a small oscillator.  
"You made yours?" Fred enquired.  
Bill indicated his Morse key and its attachment. Fred looked at it in disbelief.  
"Is that it?"  
"Yes", said Bill. Fred examined it in disbelief. He pressed the Morse key and a strange wail could be heard.  
"It works", said Bill. "There's a bit of play on the key".

"Bit of play?" Fred exclaimed. "You could crack nuts with it! Where did you get the squeaker?"  
"Built it myself".  
Fred said nothing. He had seen some of Bill's efforts before. At least this one couldn't do anybody any harm. Fred gave his key a couple of taps and looked at Bill.

## Ted Holmes VK3DEH 20 Edmunds Street, Parkdale, Vic. 3195

"Ready?" he enquired. Bill nodded, whereupon Fred began to tap out Morse at what seemed to Bill a frightening speed. Fred saw that Bill was having trouble and stopped, saying nothing. Bill was going through the pretence that his pencil wouldn't write properly. He waited and then sent again. Once more Bill got nothing.

"You have a go", said Fred. Bill brightened up immediately and switched on the oscillator. He started hammering away at the key and produced a symphony of wailing reminiscent of air raid sirens, accompanied by a rhythmic sound like castanets. Then suddenly stopped.

"You get it?" he asked.  
"You must be joking", Fred replied. "Sounds like a cat's home in the throes of being machine-gunned. You'll have to do something about that oscillator."

"I built it exactly the way I saw it in AR", Bill replied indignantly. Again Fred said nothing. He knew only too well that nothing Bill built ever followed the diagram. Things were changed, according to the junk available at the time.

"I've got a better idea", said Bill and disappeared out of the room. Fred waited, casting his eyes around the all too familiar shack. The place looked as though it had recently been visited by Whelan the Wrecker. Bill reappeared, carrying two cans and two glasses.

"A good drop this", Bill remarked, holding up one of the cans, giving it a shake, then opening it and spraying Fred's oscillator with the contents.

## ADDENDUM

The winding details of the toroids were omitted from Figure 1 in the article "75 ohm High Pass Filter" which was published in January's AR.

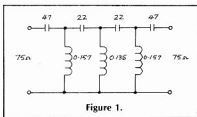


Figure 1.

Capacitance is in pF and Inductance is in  $\mu$ H.  
0.157  $\mu$ H Inductance — 14 turns of 0.5mm enamelled wire on an Amidon T37.0 toroid.  
0.135  $\mu$ H Inductance — 12 turns of 0.5mm enamelled wire on an Amidon T37.0 toroid.  
Capacitors are ceramic NPO 10 percent or better.

## BATTERY DEVELOPMENT

Researchers at Murdoch University, in Western Australia, have developed a new type of electric cell. The key to the invention is an electrolyte for a zinc bromine cell. They are said to lightweight, cheap, and could produce twice the power of conventional lead acid cells.

AR



## NOTICE



## DEADLINE

All copy for inclusion in the April 1986 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by midday, 21st February 1986.

# Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details: eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.

\* Please remember your STD code with telephone numbers.  
\* Eight lines free to all WIA members. \$9.00 per 10 words minimum for non-members.  
\* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162.  
\* Repeats may be charged at full rates.  
\* QTHR means address is correct as set out in the WIA current Call Book.

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.  
\$22.50 for four lines, plus \$2.00 per line (for part thereof).

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Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

## # TRADE ADS #

**AMIDON FERROMAGNETIC CORES:** Large range for all receiver & transmitting Applications. For data & price list send 10x22mm SASE to: **RJ & US IMPORTS**, Box 157, Mordialloc, NSW 2223. (No inquiries at all) — 11 Mackinnon Street, Caulfield, Agencies at: Geoff Wood Electronics, Rozelle, NSW, Truscott Electronics, Croydon, Vic, Willis Trading Co, Perth, WA, Electronic Components, Fishwick, Plaza, ACT.

## # WANTED — NSW #

**ICOM 720 or 730:** or similar rig, in GC, VK2KTO. Ph: (067) 66 4437.

**MEMORY MODULE (DMS UNIT):** for Yaesu Model FT-107. Ph: (043) 24 7630.

**YAESU FT-70R:** 70cm all mode lcvt. Larry VK2EOY. Ph: (02) 949 3124.

## # WANTED — VIC #

**FRONT PANEL:** Plastic trim (Plastic Escutcheon) for the S meter and analogue freq read-out of a Yaesu FT-101 lcv. Michael VK3CBV, 32 Sullivan Street, Springvale, Vic 3171. Ph: (03) 546 8218.

**POWER SUPPLY:** for Type 3 Mark 2 tcvr, or complete tcvr, 2m FM tcvr for mobile use. What offers? VK3COM. Ph: (03) 560 9215.

**SOCKETS:** Glant 7 pins to suit valve type 813. Garry Marcon VK3AJX, 2 Lown Court, Frankston, Vic. 3199. Ph: (03) 789 4363.

**SPEAKER:** 5cm, 32 ohms, for Standard H-hold lcvr, Model SR-C 148A. VK3AAP QTHR. Ph: (055) 62 6016.

**VALVES:** 6CX8; 12AX7; 6DE7; ECH81; EF183; EC801 (2); E28; K78. Bill VK3AJQ, QTHR. Ph: (03) 758 5041.

**YOUNG ENTHUSIAST:** requires older type Morse code keys, bugs, telegraphic equip, etc. incl commercial, military, and amateur types. Working or not. Will pay a good fair price. Also require any literature that may accompany the keys. Maurie VK3CBW, PO Box 2742, Mildura, Vic. 3500. Ph: (050) 22 2120 reverse charges.

## # WANTED — QLD #

**OLD TYPE TX:** such as Yaesu FT100, FL100B or KW series. Must be in good working order. N Richardson VK4BHJ, QTHR. Ph: (07) 354 3989.

## # WANTED — SA #

**MOSLEY TA-33 HF BEAM ANT:** Any information at all as all information is urgently required. Send details to D A Sharp LS1019, 142 East Terrace, Henley Beach, SA. 5022. Ph: (08) 356 8304 until 9pm. All correspondence answered.

**YAESU FT-7B TCVR:** with effective NB. Ray VK5AVR, QTHR. Ph: (087) 62 2034.

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**ALDA 103:** In good cond. \$375 ONO. Ph: (067) 66 4437.

**DATONG D70 MORSE TUTOR:** with mini-earphones. Variable speeds & delays. As new. \$70 posted anywhere in Aust. Tony VK2ECB. Ph: (049) 2 5932.

**DX-362 COMMS RK:** Mint cond, digi readout, h'book, & carton. Complete \$270 ONO. Ken VK2PVK. Ph: (02) 644 7346.

**HYGAIN 204BA MONOBAND YAGI:** for 20m, in original carton. Never used incl all hardware & instr book. 20m. Ian VK2CJR, QTHR. Ph: (02) 44 4985.

**MULTI 7:** 1/10W, ch 1; 2; 3; 4; 6; 7; 8; 50; 51 with mobile cradle. \$75. VJ5JR vert. ant. 5 band. Near new, very good. \$50. Denis VK2AEO, QTHR. Ph: (063) 62 5977.

**Q METER:** Model QM1, freq range 150kHz-18MHz, 240V. \$75 ONO. VTYM Model V7, 0-1500V DC & AC, resistance to 1000Mohms, input R 11Mohms, 110V. \$45 ONO. TV alignment meter. Model TSA, 110V. \$45 ONO. Philips VTYM Model GM6058, CW all probes 0-1000V DC, 100mV-300V AC, AC & DC current, resistance to 1000Mohms. \$85 ONO. Art VK2AS, QTHR. Ph: (02) 467 1784.

**SWAN TB2A ANTENNA BEAM:** ant rotator & mast. To be sold together. Ph: 871 7758.

**TRANSVERTER:** 28-430MHz Microwave modules, Model Q42285 — all modes, 10W. Hustler HF mob ant, 80-10m. Mast plus 5 resonators. Like new \$100. Larry VK2EOY. Ph: (02) 949 3124.

**VK2AXZ FOOD RECIPE COOK BOOK:** with simple everyday ingredients. Collector's item, limited edition. Worthily cause (the continuous operation of a radio club). \$2 incl post. Westlakes APC, Box 1, Terahra, NSW 2284.

**YAESU FT-580R:** all mode 6m tcvr. VGC. \$400 ONO. Neil VK2ZTL, QTHR. Ph: (02) 449 8890 BH only.

**YAESU FT-7700 RX:** 12 ments, FRV, UHF converter type B-FRA, AKT, incl -FRT ant tuner. New Cond. h'book. \$500. Tony VK2EGH, QTHR. Ph: (02) 476 6108.

## # FOR SALE — VIC #

**MAGAZINES:** Amateur Radio 1981-84 in GC. \$10. Tech Te-15 GDO, 440kHz-280MHz. \$30. JVC service manuals for GZ-S3 camera, HR-C3 recorder. VGC. \$50. Undine Model 1A Replica Wireless circa 1920. VGC. \$70. AR DX Club mag. Jul 81-Sep 85, in binders. VGC. \$20. Micrastra transistor tester. \$15. Jeff L30409, QTHR. Ph: (03) 546 3940 AH.

**DRAKE MM-75:** matching network (ATU), incl SWR & pwr meters built in. Takes 300W. EC. \$200. Murray VK3AAI. Ph: (053) 42 0447.

**ICOM 735 FULLY TUNABLE:** accessories. Brand new; still in box. Mable warreny mab rig only. \$1195. Ph: (051) 74 1381 BH or (051) 99 2393 AH.

**KENWOOD TS-530SP:** plus remote VFO 240, MC355 mic & leads, plugs, etc. Still within guarantee period. Definitely no mods. Mint cond. Current model. Manual incl. \$850. Frank VK3CFJ. Ph: (03) 877 5607.

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**WERNER WULF 10/15m INTERLACED YAGI:** Ph: 10m: 3el 15m. VGC \$110. Stuart VK3OWU, Ph: (03) 791 3619.

**YAESU FL-2100Z:** 15 months old in VGC. \$670. Rotator. SAA-X103. Near new \$210. Jim VK3NRJ, Ph: (03) 387 6820.

**YAESU EQUIPMENT:** Tcvr FT-101ZD \$550. Multiscope Y-901 \$285. Ant tuner FC-902 \$150. Ext spk SP-901 \$30. Desk ant. YD-444A \$30. Dummy load wait meter VP-150 \$65.

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**MICROWAVE MODULES:** 70cm i'vterit MMS 435/28S in perfect cond as new, with manuals. \$300. VK4ABV, QTHR. Ph: (07) 683 1477.

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## # FOR SALE — WA #

**KENWOOD TS-120S:** AT-120; MB-100; MC-35; manual; opt cartons; used sparingly — mint condition. \$500 complete. Alastair Sutherland VK6AES, 3 Seagate Road, Safety Bay, WA. 6169. Ph: (09) 458 0136 BH or (095) 27 7233 AH.

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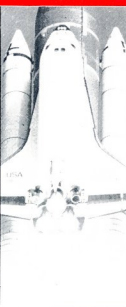


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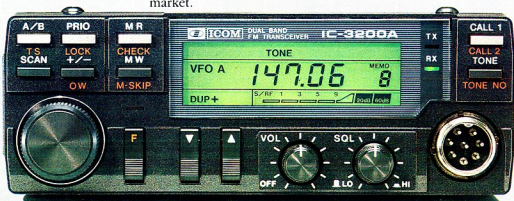
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